
Meridian 1

Nortel COMPANION Microcellular

Operations, administration, and maintenance guide

Document Number: 553-3611-300

Document Release: Standard 2.00

Date: December 1997

© 1997

All rights reserved

Printed in the United States of America

Information is subject to change without notice. Northern Telecom reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules, and the radio interference regulations of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

SL-1™, Meridian 1™, and COMPANION™ are trademarks of Northern Telecom. Microsoft® is a registered trademark and Windows™ and MS Windows™ are trademarks of Microsoft Corporation. ANDREW® and HELIAX® are registered trademarks of Andrew Corporation. NOKIA® is a registered trademark of Nokia Corporation. ZK-SAM™ is a trademark of ZK CELLTEST INC. ORBIX™ is a trademark of IONA.

Tell us what you think...

This is your document. Nortel wants it to work well for you.

Please take a few minutes to answer the questions on the other side of this page. Fax it back to us at the number provided, or mail it to the address below.

Your comments will be used to make improvements.

Thank you. We appreciate your time and consideration.

Enterprise Networks Training and Documentation

Return mail address:

Documentation User Comments Survey
Enterprise Networks Training & Documentation
P.O. Box 833858
m/s H300
Richardson, Texas 75083-3858
USA

Fax to:

Documentation User Comments Survey
Enterprise Networks Training and Documentation
1-972-684-8699

Document name _____

Document NTP or PO number (if available) _____

Please circle the most appropriate number on the scale for each question.

- | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|----|
| 1. | Overall, are you satisfied with this document? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |
| 2. | Is it easy to find information in this document? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |
| 3. | Have you found the information in this document to be technically accurate? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |
| 4. | Is this document clearly written? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |
| 5. | Is the information in this document complete for its purpose? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |
| 6. | Does this document help you do your job? | | | | | | | | |
| | Yes | 7 | 6 | 5 | 4 | 3 | 2 | 1 | No |

Comments:

Optional: Your name _____ Fax _____
Company _____

Revision history

February 1997

Standard, Release 1.00.

December 1997

Standard, Release 2.00.

Contents

About this document	1
Audience for this document	1
Overview of this document	2
Related references	2
Microcellular systems	3
System configurations	3
Microcellular components	7
Microcellular OA&M overview	9
OA&M components	9
Configuration order for Microcellular objects	13
Distributor and cellular operator OA&M responsibilities	15
Microcellular component administration	19
Administration tasks	19
MAT Navigator window	20
MAT Meridian 1 System window	22
Microcellular object managers and property sheets	23
User interface	23
Object managers	23
Menus	25
Object manager commands and controls	27
Object states and substates	29
Help system	31

Property sheet layout for objects	31
MISP administration	33
MSPRE subsystem properties	35
EIMC administration	39
EIMC Object Manager menus	41
EIMC property sheet and Configuration page	43
MXC administration	45
MXC Object Manager menus	47
MXC property sheet and Configuration page	49
Zone administration	51
Zone Object Manager menus	52
Zone property sheet and Configuration page	54
Cell administration	57
Cell Object Manager menus	58
Cell property sheet and pages	60
Neighbor cells and external cells	62
MBS administration	63
MBS Object Manager menus	64
MBS property sheet and Configuration page	65
Radio administration	68
Radio Object Manager menus	69
Radio property sheet and Configuration page	71
AFP region and AFP Station administration	73
AFP Region Object Manager menus	74
AFP Region property sheet and pages	75
AFP RSSI measurements	79
Object deletions	81
Monitoring Operational Measurements	83
Troubleshooting and maintenance	87
Microcellular Base Station problems	87
Warm-up alarms	89
Fan failure alarms	89

High temperature alarm	89
TRU-II failures	90
APS testing	92
APS alarm unit testing	95
APS power supply testing	95
Fan assembly	97
AC/DC Power Converter (NTAX73AA)	97
DC Power Converter (NT2X70CA)	97
Antenna Matrix/Compact Simplex Master Oscillator (AMO) problems	98
Portable problems	100
Portable not located	101
Microcellular card failure	101
Configuration problems	101
CMCP heartbeat failure	101
Meridian 1 INIT operation	102
Noncompliance of portable	102
Signal degradation	102
Macrocell configuration problem	102
Incorrect configuration	102
Low battery power	103
Incorrect setting of reselection offset	103
Portable not receiving calls	103
D-Channel failure (Multi-Site Networking)	103
Mobile User Directory (MUD) down (Multi-Site Networking) ...	103
Field Replaceable Units and spare parts	104
Removing power from an MBS	105
Replacing a TRU-II (NTAX98AA)	106
Replacing an AMO/MAM module (NTLA30AA)	107
Replacing the Alarm and Power Supply Unit (APS) (NTLA40AA)	108
Replacing a fan assembly	109
Feature operations	111
System capabilities	111
Meridian 1 features in a Microcellular system	112
Basic call operations	115

Feature operations via dial access	116
Tones provided on portables	117
Dial-access features	117
Abnormal operations	124

Appendix A: Microcellular feature descriptions . 125

500/2500 Line Disconnect (S)	125
500/2500 Disconnect for Outgoing Calls (S)	126
Access Restrictions (S)	126
Access to Paging (S)	126
Access to Recorded Telephone Dictation (S)	126
ACD Agent/Supervisor (U)	127
Attendant features	127
Attendant End-to-End Signaling (S)	127
Automatic Timed Reminders (S)	127
Barge-In/Busy Verify (U)	127
Busy Lamp Field (S)	128
Splitting (S)	128
Call Detail Recording on redirected incoming calls (S)	128
Call Forward	129
Call Forward All Calls (S)	129
Call Forward Busy (S)	129
Call Forward External(S)	129
Call Forward No Answer (S) and Second Level Forward No Answer (P)	130
Call Hold/Exclusive Hold (U)	130
Call Park (S)	131
Call Park - Networkwide (S)	131
Call Pick-Up/Call Pick-Up Directed (U)	131
Call Redirection By Time of Day (S)	132
Call Redirection Service (P)	132
Call Transfer (P)	133
Call Waiting/Station-to-Station Call Waiting (S)	133

Call Waiting Redirection (S)	133
Call-By-Call Service on NI-2 TR1268 (S)	134
Called Party Disconnect Control (P)	134
Calling Line ID (S)	134
Calling Party Name Display (P)	134
Centrex Switchhook Flash (U)	135
Conference (3 and 6 party) (P)	135
Direct Inward System Access (S)	135
Direct Private Network Access (S)	135
Directory Number Expansion (S)	135
Electronic Switched Network (ESN)	136
End-to-End Signaling (S)	136
ESN Uniform Dialing Plan (S)	136
Network Alternate Route Selection (S)	136
Network Call Transfer (P)	137
Network Class of Service (NCOS) (S)	137
Network Control Signaling (S)	137
Network Ring Again (U)	137
Enhanced Flexible Hotline (P)	138
Hunting (P)	138
INIT ACD Queue Call Restore (S)	138
Intercept (P)	139
ISDN Primary Rate Interface	139
Basic call, North America ISDN PRA connectivity (S)	139
Calling Line Identification (P)	139
Call Redirection Service (P)	140
Network Call Party Name Display (NCPND) (P)	140
Malicious Call Trace (U)	140
Message Waiting Indication (MWI) Interworking with DMS 100 (S)	141
Messaging Centers	141
IMS/IVMS (S)	141
Meridian Mail (S)	142

Message Waiting Center (P)	142
Multiple Appearance Directory Number (P)	142
Multi-Customer (S)	143
Music Package/Enhanced Music (S)	143
Network Message Services	143
Meridian Mail (S)	143
Message Centers (P)	144
TRO Before Answer (S)	144
Night Service/TAFAS (P)	144
One Number Call Delivery (S)	145
Pretranslation (S)	145
Recorded Announcement (S)	145
Recorded Announcement for calls diverted to external trunks (S) ...	146
Recorded Announcement in ACD Queue (P)	146
Secretarial Filtering (S)	146
Speed Call /System Speed Call (P)	146
User Selectable Call Redirection (P)	147
Timed Forced Disconnect (S)	147
Trunk Anti-Tromboning (S)	147
Wireless Privacy (S)	147
 Appendix B: Meridian Administration Tool (MAT)	149
MAT shell	149
Alarm management	149
Log browser	150
MAT access	150
Session control	150
Lock management	150
 List of terms	151

List of figures

Figure 1	
Microcellular system model (Options 51C, 61C, 81, and 81C)	4
Figure 2	
Microcellular system with serial connection to AFP Station	5
Figure 3	
Microcellular system model (Option 11C)	6
Figure 4	
Microcellular components overview	8
Figure 5	
Microcellular OA&M components	12
Figure 6	
Microcellular component “tree”	14
Figure 7	
Distribution of system management responsibilities	15
Figure 8	
MAT Navigator window	21
Figure 9	
MAT Meridian 1 System window	22
Figure 10	
Generic Microcellular object manager window	24
Figure 11	
Property sheet common to all object managers	32
Figure 12	
Subsystem Object Manager window	35

Figure 13	
Subsystem property sheet, Heartbeat page	36
Figure 14	
Subsystem property sheet, MSPRE page	37
Figure 15	
EIMC Object Manager window	40
Figure 16	
EIMC property sheet, Configuration page (Option 51C, 61C, 81, or 81C)	43
Figure 17	
EIMC property sheet, Configuration page (Option 11C)	44
Figure 18	
MXC Object Manager	46
Figure 19	
MXC property sheet, Configuration page (Option 51C, 61C, 81, or 81C)	49
Figure 20	
MXC property sheet, Configuration page (Option 11C)	50
Figure 21	
Zone Object Manager	52
Figure 22	
IS-136 Zone property sheet, Configuration page	55
Figure 23	
IS-54B Zone property sheet, Configuration page	56
Figure 24	
Cell Object Manager	57
Figure 25	
IS-136 Cell property sheet, Configuration page	60
Figure 26	
IS-54B Cell property sheet, Configuration page	61
Figure 27	
MBS Object Manager	63
Figure 28	
MBS property sheet, Configuration page	66

Figure 29	
Radio Object Manager	68
Figure 30	
Radio property sheet, Configuration page	71
Figure 31	
AFP Region Object Manager	73
Figure 32	
AFP Region property sheet, Configuration page	76
Figure 33	
Add AFP Station dialog box	77
Figure 34	
AFP Station property sheet, Configuration page	78
Figure 35	
AFP Commands Log window	80
Figure 36	
Troubleshooting flowchart—RF problems	93
Figure 37	
Alarm and Power Supply Module (APS)	96
Figure 38	
Fan assembly	97
Figure 39	
Antenna Matrix/Compact Simplex Master Oscillator	99

List of tables

Table 1	
Mobility System Management and CMCP operations	17
Table 2	
Definition of controls for the object manager window	24
Table 3	
Object manager menu commands	27
Table 4	
Object manager property sheet buttons	29
Table 5	
Object manager State and Substate columns	30
Table 6	
Controls common to all property sheet pages for all objects	33
Table 7	
MISP configuration (LD 27)	34
Table 8	
Microcellular Operational Measurements	84
Table 9	
Operational Measurement descriptions	85
Table 10	
Summary of alarm information	88
Table 11	
TRU-II LED displays when not in service	91
Table 12	
TRU-II LED displays during programming	92

Table 13	
Base Station LEDs and their indications	94
Table 14	
Field Replaceable Units and spare parts	104
Table 15	
Operational sequence for normal calls	115
Table 16	
Special features and their MFCO default codes	116
Table 17	
Activating Call Forward All Calls	117
Table 18	
Verifying Call Forward	118
Table 19	
Canceling Call Forward All Calls	118
Table 20	
Parking a call	119
Table 21	
Retrieving a parked call	120
Table 22	
Answering a Call Park recall	121
Table 23	
Answering a Call Waiting call	121
Table 24	
Adding a new party to a call	122
Table 25	
Making a System Speed Call	123
Table 26	
Call Transfer	124

About this document

This document describes how to perform operations, administration, and maintenance for a Nortel COMPANION Microcellular system through the Mobility System Management (MSM) application running on a Meridian Administration Tool (MAT). This document also describes hardware troubleshooting and maintenance.

Audience for this document

This document is for anyone who needs to perform Microcellular operations, administration, or maintenance tasks, including the following personnel:

- System administrators
- Craftspersons
- Distributor support, installation, and maintenance personnel
- Project planners
- Sales engineers and managers

Overview of this document

This document provides the following information:

- Normal functions of a Microcellular system
- How to perform administration tasks for each Microcellular system component through the MSM MAT
- How to change the configuration of Microcellular components
- How to perform system troubleshooting and maintenance
- How to produce reports and monitor performance
- Feature operations and interactions
- Glossary of terms

For information about the installation and initial configuration of a Microcellular system and its components, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

For information on MAT installation, see the *Meridian Administration Tools Common Services User guide* (A0658266).

Related references

In addition to this guide, the following Nortel publications provide information about the Microcellular product and the MAT:

- *Nortel COMPANION Microcellular Overview* (553-3611-100)
- *Nortel COMPANION Microcellular Site planning and deployment guide* (553-3611-105)
- *Nortel COMPANION Microcellular Multi-Site Networking Description, operations, and administration* (553-3611-110)
- *Nortel COMPANION Microcellular Installation guide* (553-3611-200)
- *Meridian Administration Tools Common Services User guide* (A0658266).

Microcellular systems

The Nortel COMPANION Microcellular system provides both in-building and wide area mobility, using a single, standard cellular portable. The Microcellular system is fully integrated within a Meridian 1 system, so users have access to a number of popular Meridian 1 features on their portables while in-building. For a Microcellular system to coexist with the macrocellular network, the cellular service provider must maintain control over the private system through a workstation, the Cellco Mobility Control Point (CMCP), at the cellular company's site.

The Microcellular system supports the IS-136 and IS-54B radio protocols. A Release 23 system supports TDMA-3 ACELP (Algebraic Code Excited Linear Predictive), a method of implementing EFRC (Enhanced Full Rate Codec) in IS-136 systems. ACELP implements the IS-641 protocol to provide toll-line voice quality. A Microcellular system can also use VSELP (Vector Sum Excited Linear Predictive) for voice encoding.

The rest of this section provides a brief overview of Microcellular systems. For detailed information about Microcellular components, see the *Nortel COMPANION Microcellular Overview* (553-3611-100) or the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

System configurations

Figure 1 gives an overview of Microcellular components for Option 51C, 61C, 81, and 81C systems. This figure illustrates a TCM connection between a local Meridian Administration Tool (MAT) and an Automatic Frequency Planning (AFP) Station through a Meridian Communications Unit (MCU).

Figure 2 illustrates the hardware components of a Microcellular system with a direct serial connection between an AFP Station and the local MSM MAT, through short-haul modems and telephone cable.

Figure 1
Microcellular system model (Options 51C, 61C, 81, and 81C)

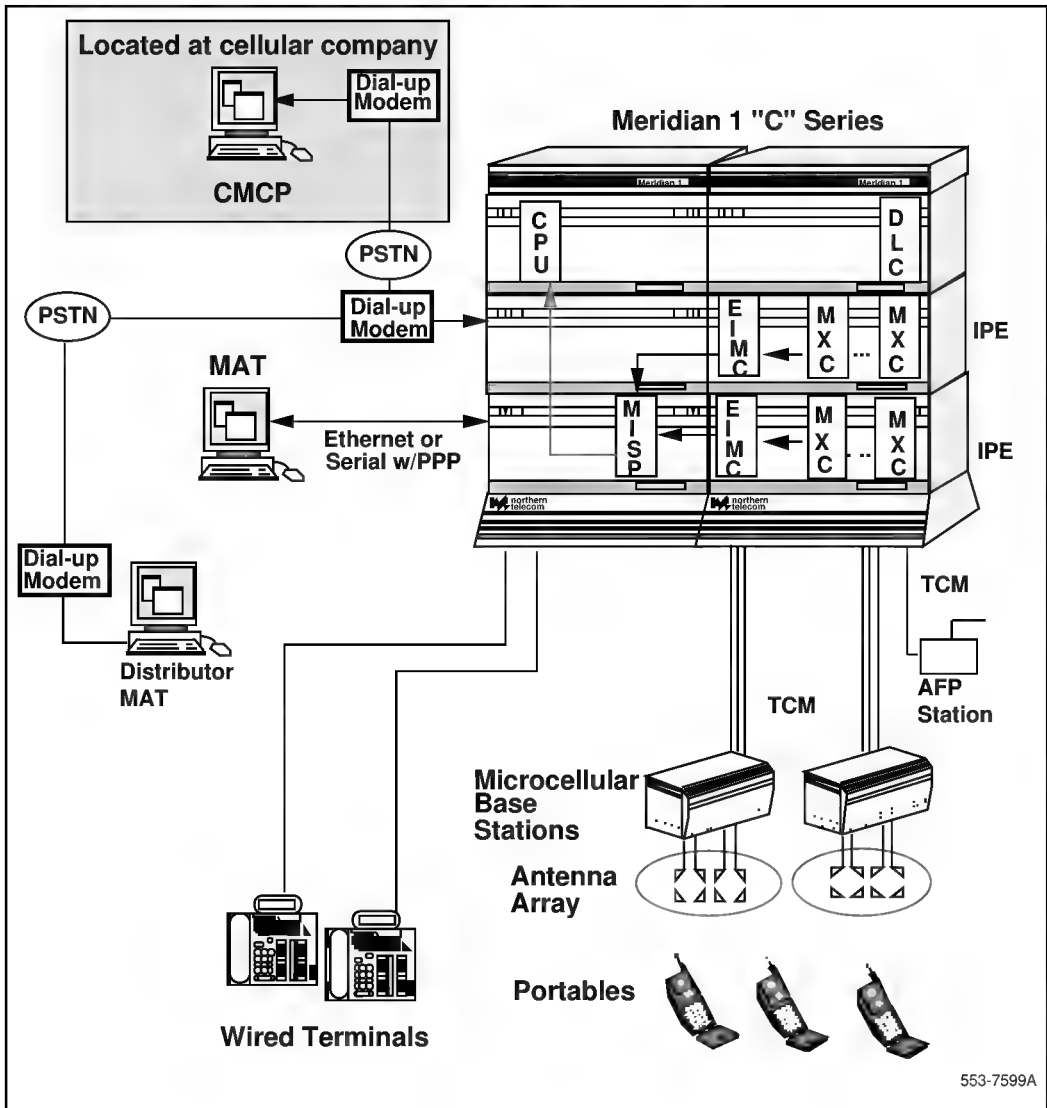
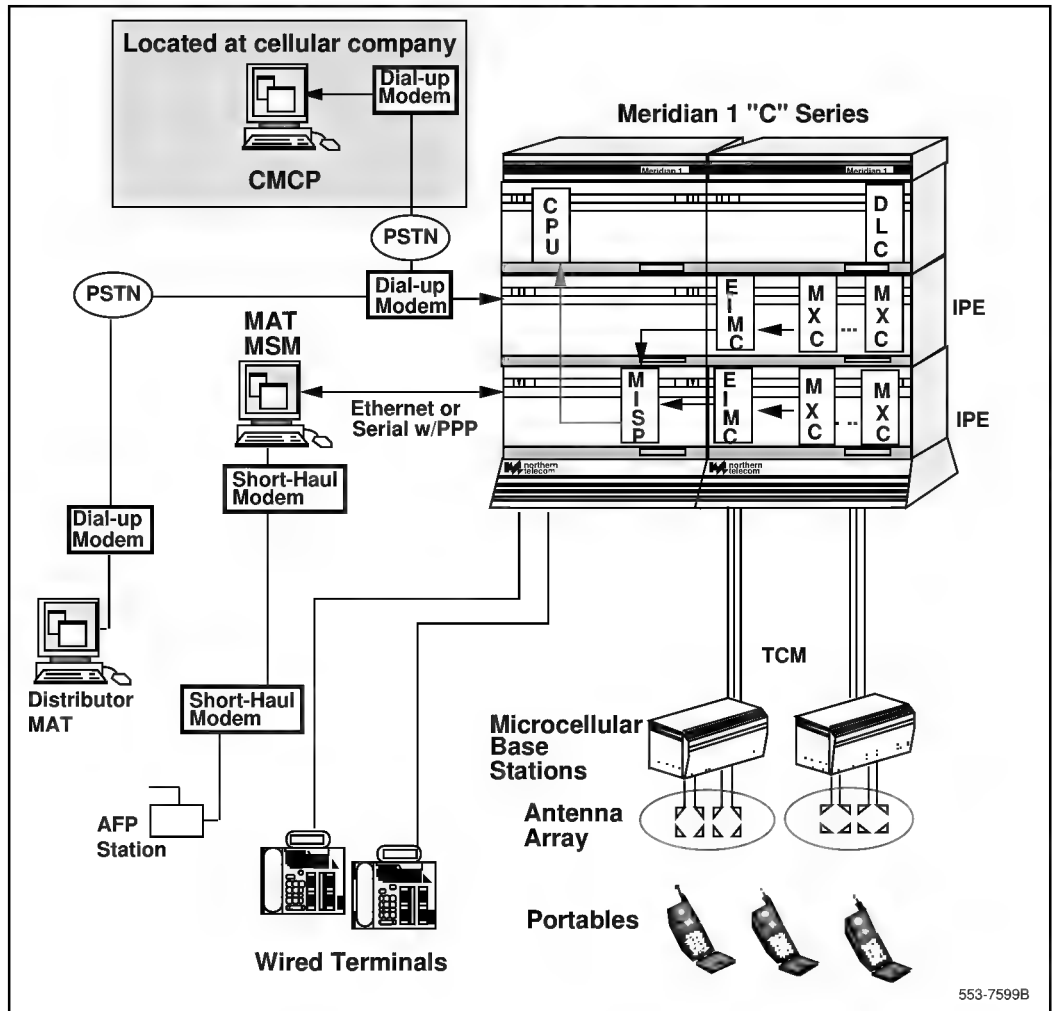
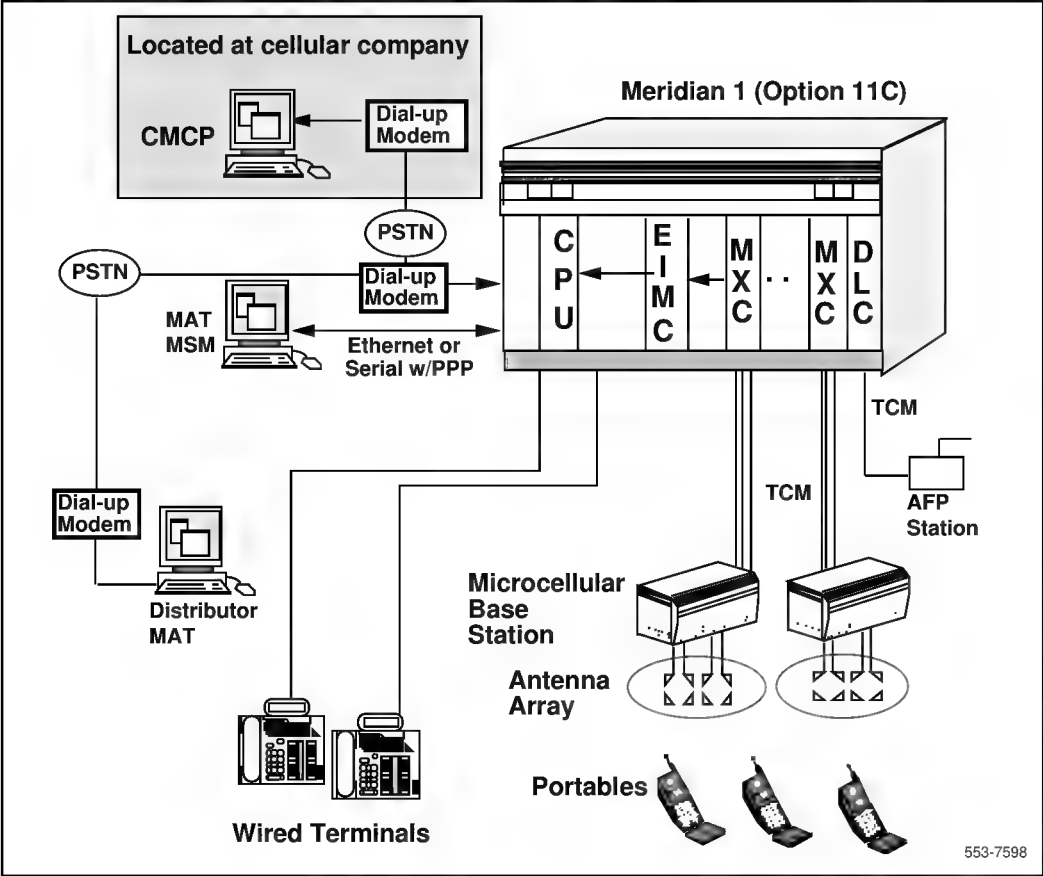


Figure 2
Microcellular system with serial connection to AFP Station



The Microcellular configuration is different for the smaller Option 11C systems, as Figure 3 shows. This figure illustrates a TCM connection to an AFP Station.

Figure 3
Microcellular system model (Option 11C)



Microcellular components

A Microcellular system has the following hardware and software components:

- Meridian 1 Core software
- Multipurpose ISDN Signaling Processor (MISP)
- Embedded Intelligent Mobility Controller (EIMC)
- Microcellular Transcoder Card (MXC)
- Antenna array and hybrids (combiner/splitters)
- Microcellular Base Station (MBS), including TRU-IIs
- Automatic Frequency Planning (AFP) Station and either of the following:
 - Meridian Communications Unit (MCU)
 - A pair of short-haul modems for each AFP Station
- Microcellular portables
- Meridian Administration Tool (MAT)

A Release 23 Microcellular system requires Mobility System Management (MSM) with the AFP feature on a local (on-site) MAT (running MAT 5.7+ software). The distributor might still choose to manage the site through an additional, remote MSM MAT.

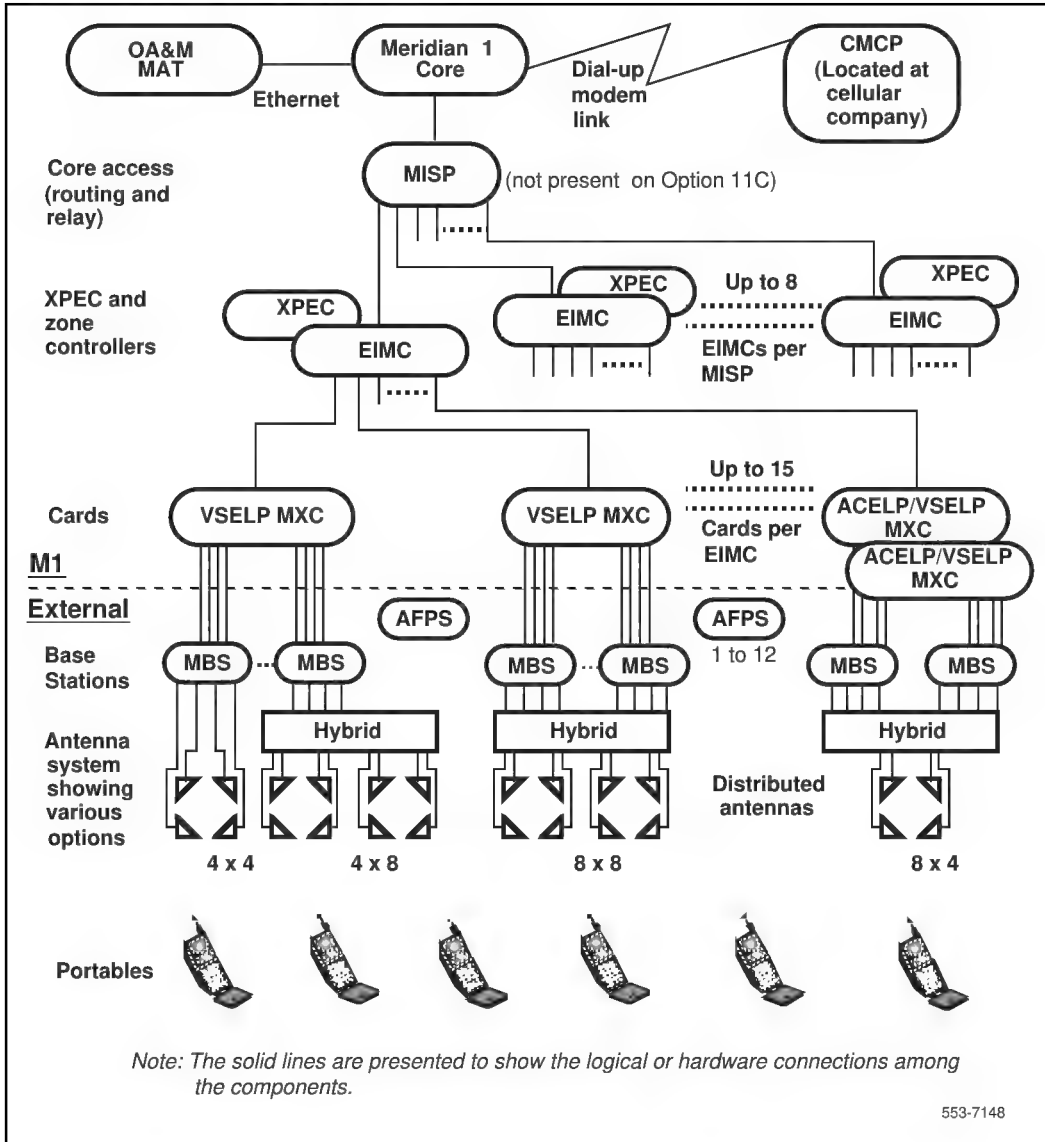
- CMCP (Cellco Mobility Control Point) application on a MAT

A Microcellular system also includes the following logical components:

- Subsystem
- Zone
- Cell
- AFP region
- Neighbor cell

Figure 4 illustrates these components and their connections.

Figure 4
Microcellular components overview



Microcellular OA&M overview

This section presents the following information about operations, administration, and maintenance (OA&M) for a Microcellular system:

- Microcellular OA&M components
- Configuration order for Microcellular objects
- Distributor and cellular operator responsibilities for Microcellular OA&M

OA&M components

The Mobility System Management (MSM) application running on a Meridian Administration Tool (MAT) provides operations, administration, and maintenance (OA&M) functions for a Microcellular system through a graphical user interface. A Meridian 1 system accumulates the OA&M information, which MSM retrieves and updates.

For more information on the MAT, refer to Appendix B: “Meridian Administration Tool (MAT)” on page 149 or to the *Meridian Administration Tools Common Services User guide* (A0658266).

The Microcellular system's OA&M function manages the system through the following components (see Figure 5 on page 12):

— **Mobility System Management application on a MAT**

The Mobility System Management application, integrated with the MAT OA&M interface, runs on a PC under Microsoft Windows 95®. The PC connects to the Meridian 1 system via Ethernet (local MSM MAT) or a dial-up modem with Point-to-Point Protocol (PPP) (remote distributor MSM MAT).

For an X11 Release 23 Microcellular system, Mobility System Management includes the Automatic Frequency Planning (AFP) feature that controls the AFP Stations via messages sent to each station. The APF software communicates with AFP Stations through a Meridian Communications Unit (MCU) that has TCM connections to the AFP Stations or through direct serial connections between the AFP Stations and the local MSM MAT.

These connections enable the MSM MAT to dial up individual AFP Stations as if they were Meridian 1 sets. Each AFP Station responds to commands sent by the AFP software from the MAT.

— **Meridian 1 system that includes the Microcellular system**

A Meridian 1 system hosts Microcellular OA&M as an OA&M server. The Meridian 1 system collects all data and performs all actions to administer the Microcellular components. These actions include initialization, data storage, and recovery.

— Celco Mobility Control Point (CMCP)

Cellular service providers control private systems to minimize interference with their macrocellular services. The CMCP provides this control for the Microcellular system and performs the following tasks:

- Communicates with the Meridian 1 via the Point-to-Point Protocol (PPP) over a dedicated modem.
- Completes the configuration of Microcellular components
- Monitors and manages the frequency-related activities within a Microcellular system
- Initiates and monitors a “keep-alive” heartbeat between the CMCP and the Microcellular system
- Controls Automatic Frequency Planning (AFP) for the Microcellular system

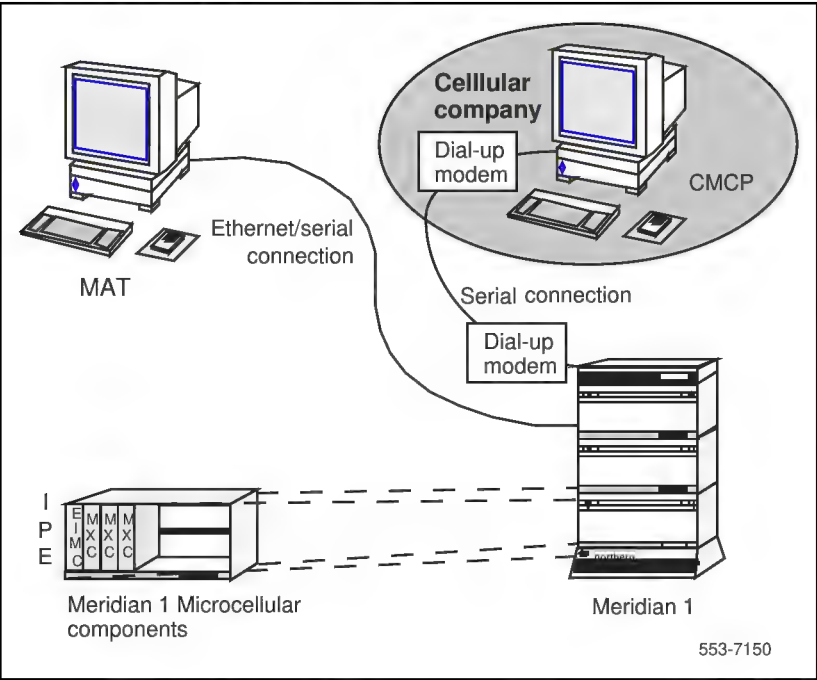
— EIMC and MXC cards

The EIMC and MXC cards are intelligent components (with memory and processors) that can perform some OA&M activities. The Meridian 1 system administers these activities, including alarm generation, operational measurement collection, and fault recovery.

For more information about these OA&M components, see the *Nortel COMPANION Microcellular Overview* (553-3611-100) or the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

For information on gathering and printing system performance and accounting statistics, see “Monitoring Operational Measurements” on page 83.

Figure 5
Microcellular OA&M components



Configuration order for Microcellular objects

An object on the MSM MAT represents each physical and logical Microcellular component. Microcellular objects have parent-child (tree-branch) relationships. A child object cannot exist without a link to its parent object(s). The following rules apply to adding and deleting Microcellular objects through the MAT:

- Before you add a child object, add its parent object or both of its parent objects.
- Before you delete a parent object, delete all of its child components.

These restrictions guarantee that all objects have valid links to their parent and child objects. This reduces the chance of an invalid Microcellular system configuration.

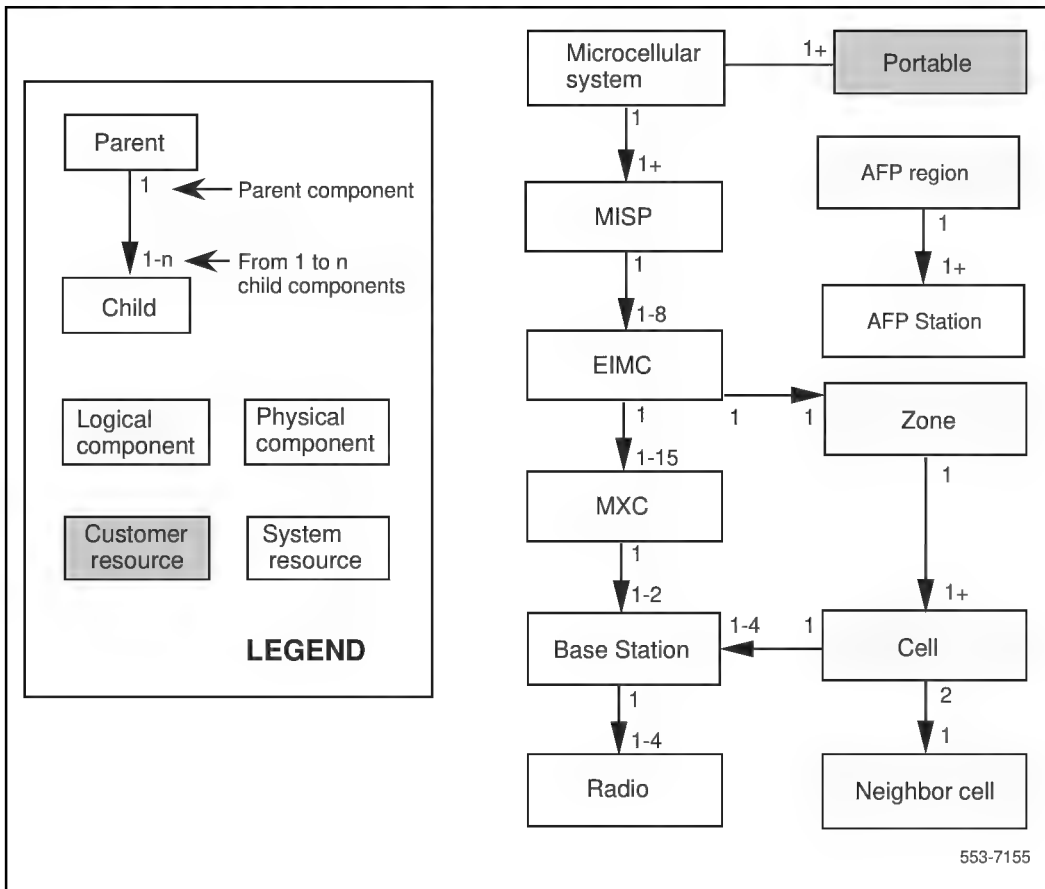
Note: For child objects that have more than one parent object, all parent objects must exist before you can add the child object.

The following configuration summary, with objects in configuration order, describes the parent-child relationships of Microcellular objects, which Figure 6 illustrates.

- 1** The MISP is a parent of from one to eight EIMC objects and a child of the Microcellular system object.
- 2** Each EIMC is a parent of one zone object and from one to 15 MXC objects (one to 12 MXCs per superloop on a VSELP-only system). Each EIMC is a child of the MISP object.
- 3** Each MXC is a parent of one or two Base Station objects and a child of one EIMC object.
- 4** Each zone is a parent of one or more cell objects and a child of one EIMC object.
- 5** Each cell is a parent of from one to four Base Station objects and a child of one zone object. A cell can be one of the two parents of a neighbor cell.
- 6** In a Microcellular system with more than one cell, one or more neighbor cell objects exist for each cell object, to define handoff paths. A neighbor cell is the child of two cells and has no child objects. An external cell can be used as one of the parent cells for a neighbor cell.

- 7 Each Base Station object is a parent of from one to four radio objects and a child of one cell object and one MXC object.
- 8 Each radio (TRU-II) object is the child of one Base Station object. Radio objects do not have child objects.
- 9 The AFP region object is the parent of one or more AFP Station objects.
- 10 Each portable object is a child of the Microcellular system object. Portable objects do not have child objects.

Figure 6
Microcellular component "tree"

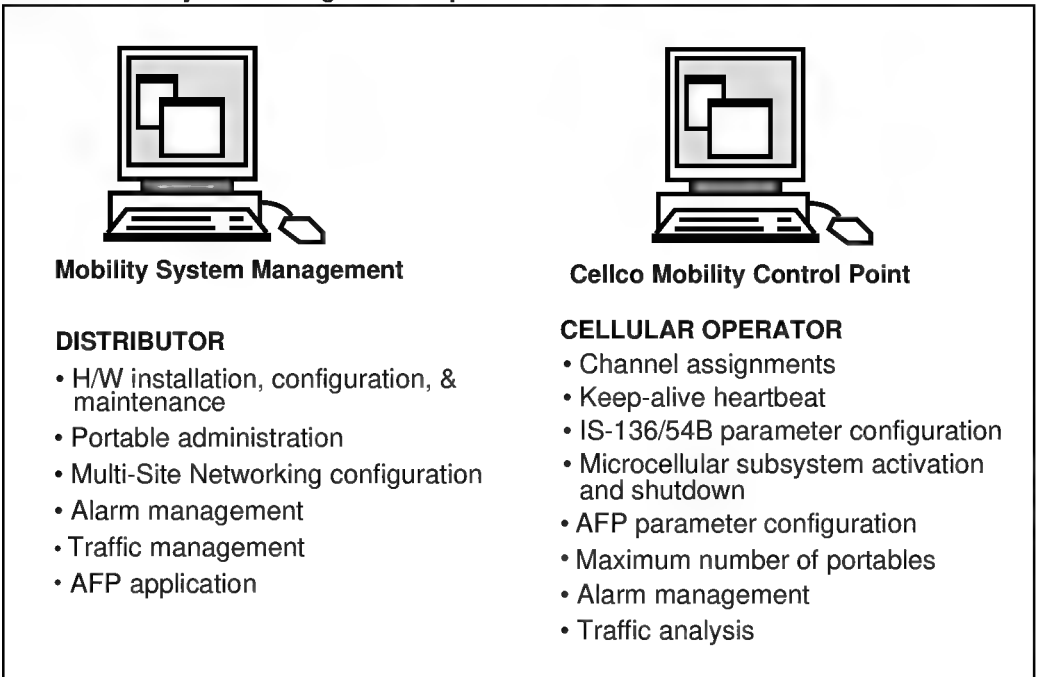


553-7155

Distributor and cellular operator OA&M responsibilities

Figure 7 gives an overview of how responsibilities for operating, administering, and maintaining a Microcellular system are distributed between the distributor and the cellular operator.

Figure 7
Distribution of system management responsibilities



Mobility System Management, an application that runs on MAT 5, is required for OA&M control over a Microcellular system, even if other system management tools are used. An X11 Release 23 Microcellular system requires MAT 5.7+. The PC connects to the Meridian 1 system via Ethernet or a dial-up modem with Point-to-Point Protocol (PPP). Based on the MAT license purchased, the MAT system can administer multiple switches.

Cellco Mobility Control Point, a MAT-based application located at the cellular operator's site, enables the cellular operator to configure the radio parameters and to monitor the RF elements of the Microcellular system. The CMCP also controls the Microcellular AFP feature. One CMCP can connect to multiple Microcellular systems.

The AFP software, which is part of MSM, must run on a MAT at the Microcellular site (local MSM MAT) with an Ethernet connection to the Meridian 1 system.

Table 1 provides a quick reference for Mobility System Management and CMCP capabilities.

Table 1
Mobility System Management and CMCP operations

	Lock/Unlock	Add/Delete	Change	View
MISP	M	M	M	M
EIMC	M	M	M	B
MXC	M	M	M	B
MBS	N/A	M	M	B
Radio	M	M	M	B
Subsystem	C	N/A	B	B
Zone	B	M	C	B
Cells	B	M	C	B
Cells (Neighbor Lists)	N/A	C	C	B
External Cells	N/A	C	C	B
AFP Regions	M	N/A	C	B
AFP Region (Stations)	N/A	M	M	B
Portables	N/A	M	M	M
Multi-Site Networking (MSN)	M	M	M	M
Mobility Alarms	M	N/A	N/A	B
Mobility OMs	M	N/A	N/A	B

M	MSM
C	CMCP
B	Both
N/A	N/A

Microcellular component administration

This section presents the following information about the Mobility System Management application that enables administration of a Microcellular system:

- Administration tasks
- MAT Navigator window, which gives you access to Meridian 1 systems
- Meridian 1 System window, which gives you access to the Microcellular object managers
- Object manager windows and property sheets for physical and logical Microcellular components

For information about the MAT user interface, see Appendix B: “Meridian Administration Tool (MAT)” on page 149.

Administration tasks

You can perform the following Microcellular administration tasks on the MSM MAT:

- Installation of Microcellular applications
- Configuration of Microcellular hardware components, including portables
- Operational measurements and reporting (to screen and to printer)

MAT Navigator window

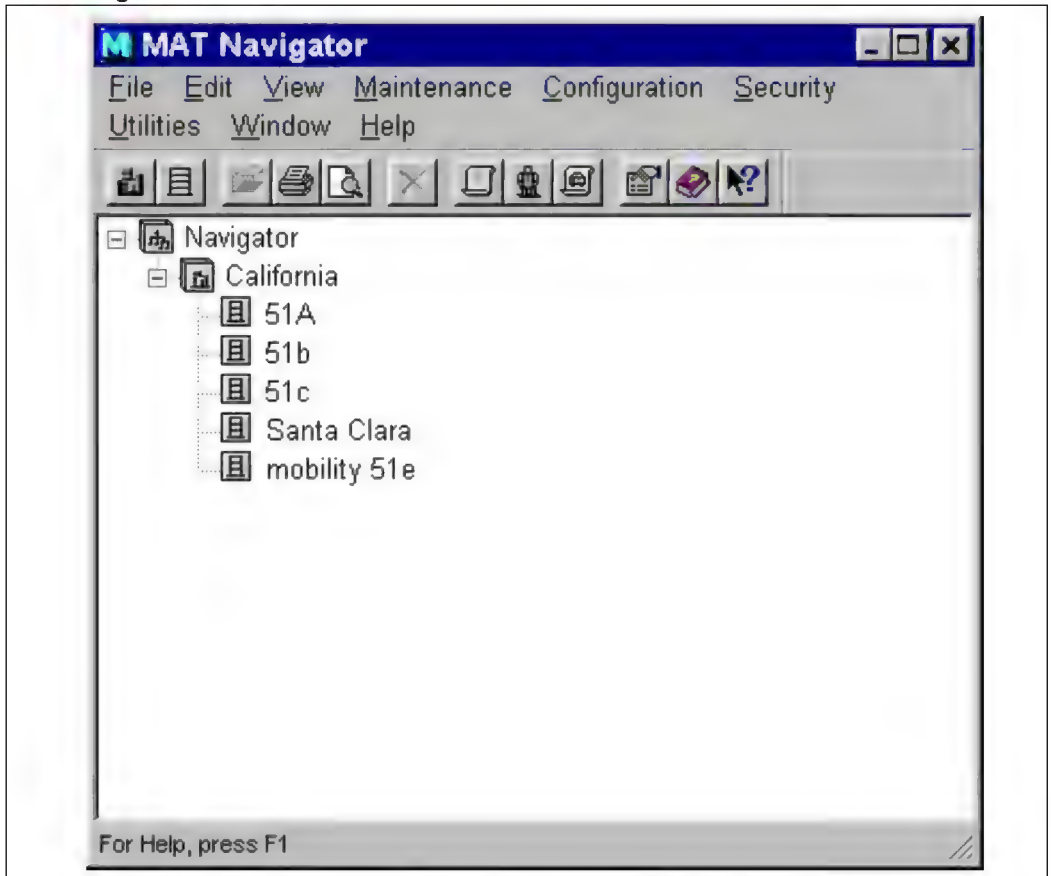
The MAT Navigator window contains icons that represent Meridian 1 sites. To begin Microcellular administration, connect to the Meridian 1 system that includes the Microcellular system through the MAT Navigator window:

- 1** To start the MAT software, select **MAT** in the Windows 95 **Programs** list.
- 2** In the MAT login dialog box, enter your MAT user ID and password and click **OK**.

The MAT Navigator window appears, as Figure 8 shows. This window contains icons that represent Meridian 1 sites. You can expand the icon tree to display systems within each site.

For more information about the Navigator window, see the *Meridian Administration Tools Common Services User guide* (A0658266).

Figure 8
MAT Navigator window



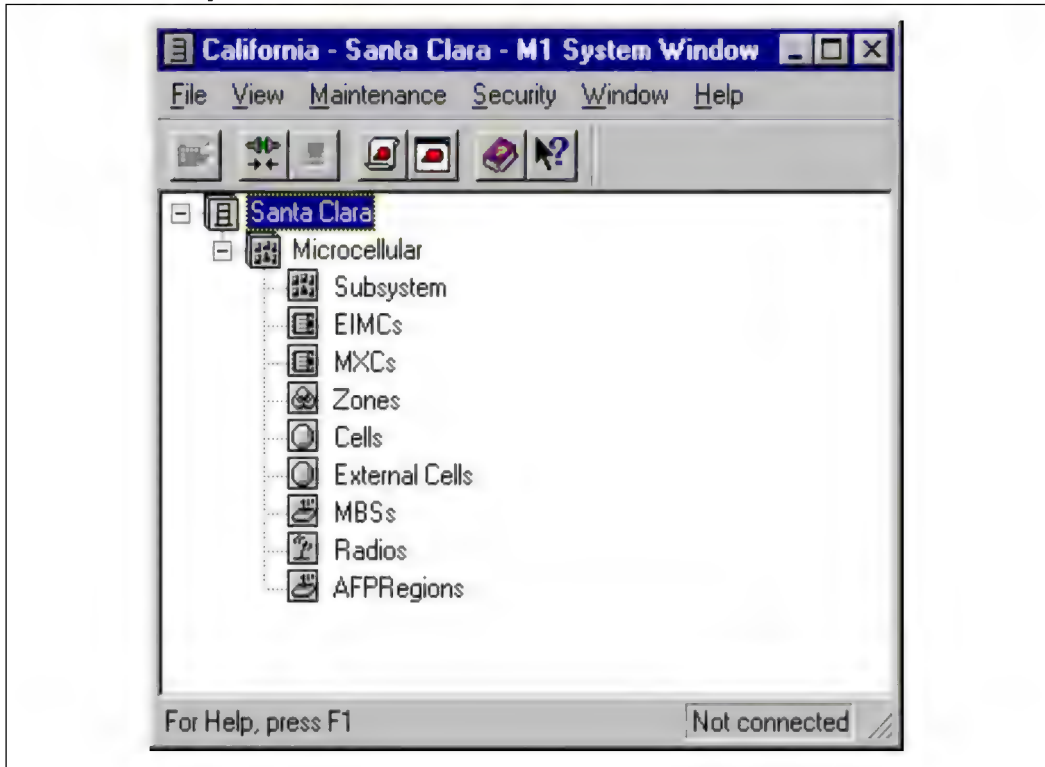
- 3 Double-click the icon of the Meridian 1 system that includes the Microcellular system, or highlight the Meridian 1 system and select **Open** from the **File** menu.
- 4 In the Meridian 1 login dialog box, enter your Meridian 1 user ID and password.

This opens a MAT System window for the Meridian 1 system, which Figure 9 illustrates.

MAT Meridian 1 System window

The Meridian 1 System window includes icons that represent each Microcellular system within the Meridian 1 system.

Figure 9
MAT Meridian 1 System window



From this window you can access all Microcellular components, applications, and system information available to manage the Microcellular system:

- An object manager window and property sheets for each component except the MISP
- The Event Monitor for the entire Meridian 1 system
- Report lists, available through the File menu in the object manager windows, for selecting, running, and printing reports

A Meridian 1 System window might include applications other than those provided for Microcellular management (for example, Maintenance windows and ESN Analysis and Routing Tool).

Microcellular object managers and property sheets

Each branch of the tree in the Meridian 1 System window exists as a detailed view (set of windows) on the MSM MAT. Each window of the set represents an object manager and contains the following fields:

- List of object instances for that class of objects (for example, MXC1, MXC2, MXC3)
- Equipment states and substates for each instance
- Result of any command issued for that object (displayed in the lower area of the window)
- Object attributes, such as the locations of objects

In an object manager window, you can perform the following user actions:

- Add, change, or delete a selected object via pull-down or pop-up menus
- Run maintenance commands
- Click on a column header to sort
- Resize the window or a column
- Use a horizontal scroll bar to see all columns
- Highlight an object instance (like MCX2) to configure attributes of the object on a **property sheet**.

User interface

The user interface consists of object manager windows, property sheets, menus, and their controls that access and carry out administration tasks. The windows displays results of carrying out commands.

Object managers

Object managers are user interface presentations of the Microcellular components (including logical components) that allow configuration and other operations for the components. For example, there is a Radio Object Manager, a Cell Object Manager, and so on, each of which has a window and

a property sheet with tabbed pages. Pages have boxes or fields in which you can specify attribute values for an object and buttons for saving attribute values and navigating through windows and property sheets.

The generic object manager window for Microcellular component management is shown in Figure 10.

Figure 10
Generic Microcellular object manager window

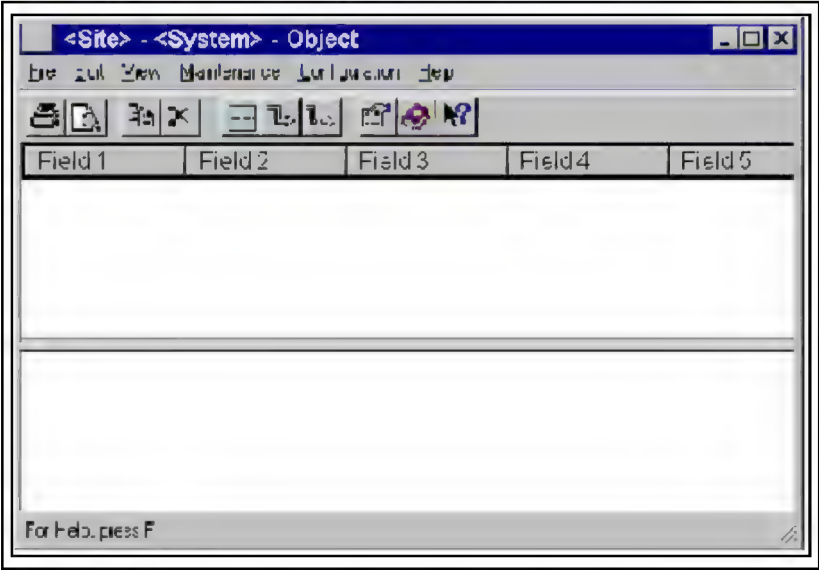


Table 2 describes the controls for all Microcellular object managers.

Table 2
Definition of controls for the object manager window

Control	Description
Object list	Single-select scrolling list with fields specific to the managed objects
Results list	Command results received from the equipment

Menus

Each object manager supports the following menus. The content of the menus might vary, however, depending on object capabilities. For actual menu commands, refer to the description of each object manager.

<u>F</u>ile	
<u>P</u> rint	Ctrl+P
Print <u>P</u> review	
Print <u>S</u> etup...	
<u>R</u> eports...	Ctrl+R
Prop <u>e</u> rties	
<u>C</u> lose	

<u>E</u>dit	
<u>C</u> opy	Ctrl+C
<u>S</u> elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u> oolbar	
√ <u>S</u> tatus Bar	

Maintenance
<u>L</u> ock
<u>U</u> nlock
<u>T</u> est
<u>F</u> orced Download

Configuration
<u>A</u> dd <Object Name>...
<u>D</u> elete <Object Name>

Help	
<u>H</u> elp Topics	F1
<u>W</u> hat's This?	Shift + F1
<u>A</u> bout Object	

Object menu

<u>L</u> ock
<u>U</u> nlock
<u>T</u> est
<u>F</u> orced Download
<u>D</u> elete
Properties
<u>W</u> hat's This? Shift + F1

Object manager commands and controls

From the MAT System window for a Meridian 1 system, you can open all the Microcellular object managers, which can add, unlock, lock, and delete Microcellular objects that represent components. From each object manager, you can open the object property sheet, which has one or more pages on which you can enter configuration information for a component. Table 3 describes the menu commands you can use in the object manager windows.

Table 3
Object manager menu commands

Command name	Action	Menu
About Object	Displays the About box for the object manager window.	Help
Add	Adds a new object based on the default template for that object type and opens the property sheet.	Configuration
Close	Closes the object manager window.	File
Copy	Places the configuration of the selected object(s) on the clipboard, from which you can paste the data into other applications as tab-delimited data.	Edit
Delete	Deletes the selected object after displaying a confirmation dialog that enables you to cancel the command. Displays a failure dialog if the object manager cannot delete the object (for example, if it is a parent of an existing object).	Configuration Object
Forced Download	Forces a software download to the selected object.	Maintenance Object
Help Topics	Displays the Help topics dialog, which contains Contents, Index, and Find tabs. This dialog is a standard Windows 95 component.	Help
Lock	Locks the selected object after displaying a confirmation dialog that enables you to cancel the command.	Maintenance Object
Print	Prints a report for the selected object(s).	File

Command name	Action	Menu
Print Preview	Displays a report in the Print Preview window.	File
Print Setup...	Displays the standard page setup dialog, for selecting printing parameters.	File
Properties	Opens the property sheet for the selected object.	File, Object
Reports...	Displays the Reports dialog box, which lists reports relevant to the object manager window and enables you to preview or print each report.	File
Select All	Selects all the objects in the object list box.	Edit
Status Bar	Toggles the display of the status bar in the object manager window.	View
Test	Performs a test on the selected object. The object manager displays the results in the results text box at the bottom of the window.	Maintenance Object
Toolbar	Toggles the display of the tool bar in the object manager window.	View
Unlock	Returns the selected object(s) to the unlocked state.	Maintenance Object
What's This?	Displays a pointer that you can use to obtain help information on an object by pointing to it.	Help

On the property sheets, you can choose, edit, or enter values to configure the object. The cellular operator enters much of the configuration information at the CMCP on the property sheets for zones and cells.

For information about zone and cell configuration from the CMCP, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Table 4 lists the buttons that you can use on object manager property sheets.

Table 4
Object manager property sheet buttons

Button	Action
OK	Saves any changes to attribute values and closes the property sheet.
Cancel	Closes the property sheet without saving any changes to attribute values since the property sheet opened or since Apply saved the attribute values.
Apply	Saves any changes to attribute values without closing the property sheet.
Help	Displays the Help text for the current page of the property sheet.

Object states and substates

The object manager windows display the states and substates of objects that you add to the Microcellular system.

Table 5 describes the operational, administrative, and usage states of Microcellular objects.

Table 5
Object manager State and Substate columns

State or Substate display	Description
Enabled	Partially or fully operational
Disabled	Not operational
Locked	Instructed not to provide service
Unlocked	Instructed to provide service
Shut down	Instructed to shut down after providing service to existing active calls; does not accept new requests for service
Idle	Available but not in use
Active	In use, with capacity for additional service
Busy	In use, with no spare capacity
Partially Configured	Component with missing or invalid settings
Not installed	Component configured correctly but corresponding hardware not present or not detectable
Initialization Required	Component waiting for Unlock operation
Initializing	Device initialization in progress
Containment Failure	Sibling component not operational
Dependency Failure	Parent component not operational
Degraded	One or more sibling components not operational, but service available through other sibling component

Help system

Access the Help system from any Microcellular system component in the following ways:

- Press Shift/F1
- Select Help from the menu bar
- Select “What’s This” or “?” from the property sheet

Content of help for objects in the Microcellular subsystem includes:

- Valid range of values for each data entry field
- Default value (where applicable) for each data entry field
- Description of each component
- List of required fields
- Required steps to configure the system, emphasizing the sequence in which components must be configured

Property sheet layout for objects

Each type of Microcellular object supports a property sheet that provides access to object attribute values. A property sheet for an object can contain more than one page, depending on the attributes of the object.

Figure 11 shows the property sheet common to all object managers.

Figure 11
Property sheet common to all object managers

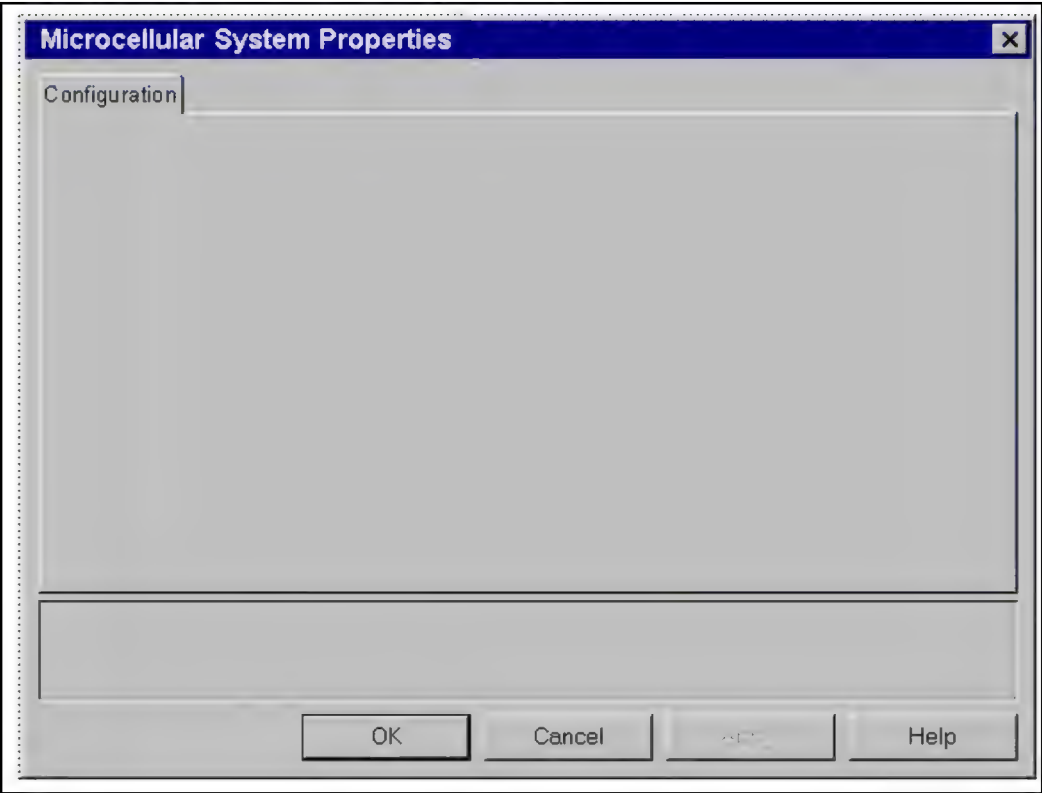


Table 6 describes the controls common to all property sheet pages.

Table 6
Controls common to all property sheet pages for all objects

Control	Description
OK	Saves the changes and closes the window
Cancel	Closes the window without saving any changes since the property sheet was opened or since the most recent changes were applied.
<u>A</u> pply	Saves the changes without closing the window
<u>H</u> elp	Displays the Help file for the current page
Results list box	Scrollable read-only text box; display results of commands and tests run against this object

MISP administration

The MISP (Multipurpose ISDN Signaling Processor) circuit card is present on Options 51C, 61C, 81, and 81C. Option 11C does not support the MISP card.

The MISP is a microprocessor-controlled circuit card that provides a communication interface between the CPU and peripheral devices. The MISP serves as an interface between the core Meridian 1 CPU and the EIMCs. It also supports the downloading of loadware to the EIMCs. In addition, the MISP is used for routing and for relaying signals between EIMCs for handoffs between zones in the Microcellular system.

Microcellular software enables call processing and communications between Microcellular components and the Meridian 1 CPU. It controls communications by translating Microcellular signals into ISDN messages that the CPU can interpret, and vice versa. The MISP also routes these messages, using the appropriate address for each device.

To configure the MISP object for a Microcellular system on an Option 51C, 61C, 81, or 81C Meridian 1 system, use overlay 27 to specify the MISP configuration and overlay 32 to enable the MISP. At the top of the System window, click the overlay icon to launch the overlay pass-through to the Meridian 1 system.

Table 7 shows the Overlay 27 configuration for the MISP for a Microcellular system.

Table 7
MISP configuration (LD 27)

Prompt	Response	Description
REQ	NEW	
TYPE	MISP	Multipurpose ISDN Signaling Processor
LOOP	0, 2, 4, ... 158	MISP loop number
APPL	MOB	Mobility Routing Application

To enable the MISP, enter the following commands for maintenance overlay 32:

```
LD32
STAT (loop)
ENLL loopnumber
```

In the ENLL (Enable Network Loop) command, *loopnumber* is the MISP loop number.

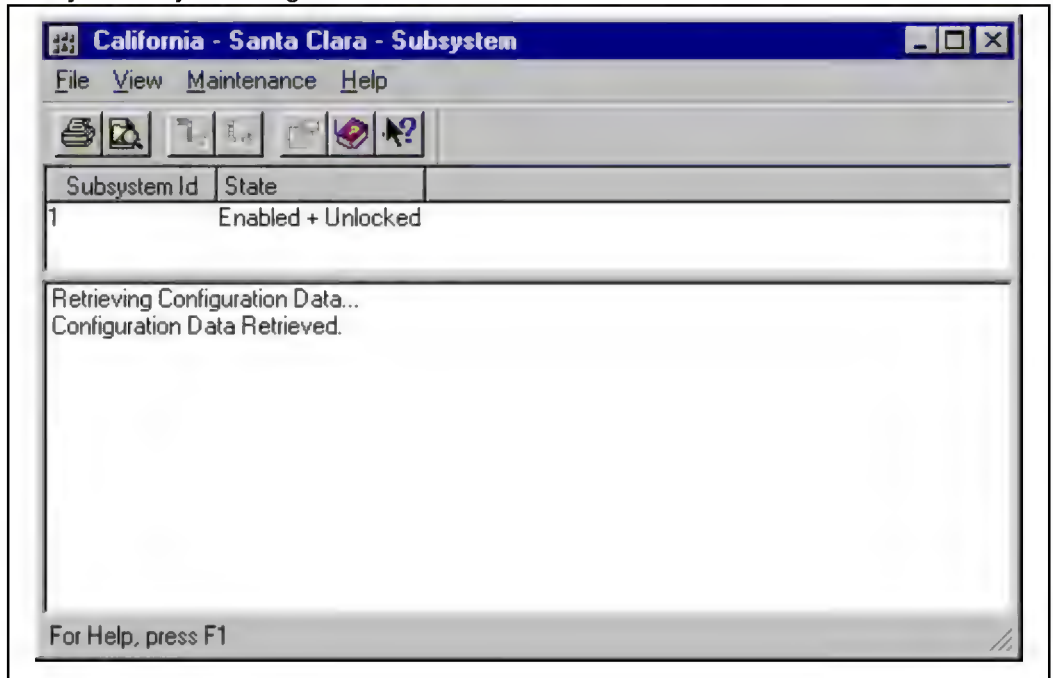
When you enable the MISP for the first time, the software download might take up to a minute to complete.

For more information on configuring and enabling the MISP, refer to the section on configuration procedures in *ISDN Basic Rate Interface administration* (553-3901-301).

MSPRE subsystem properties

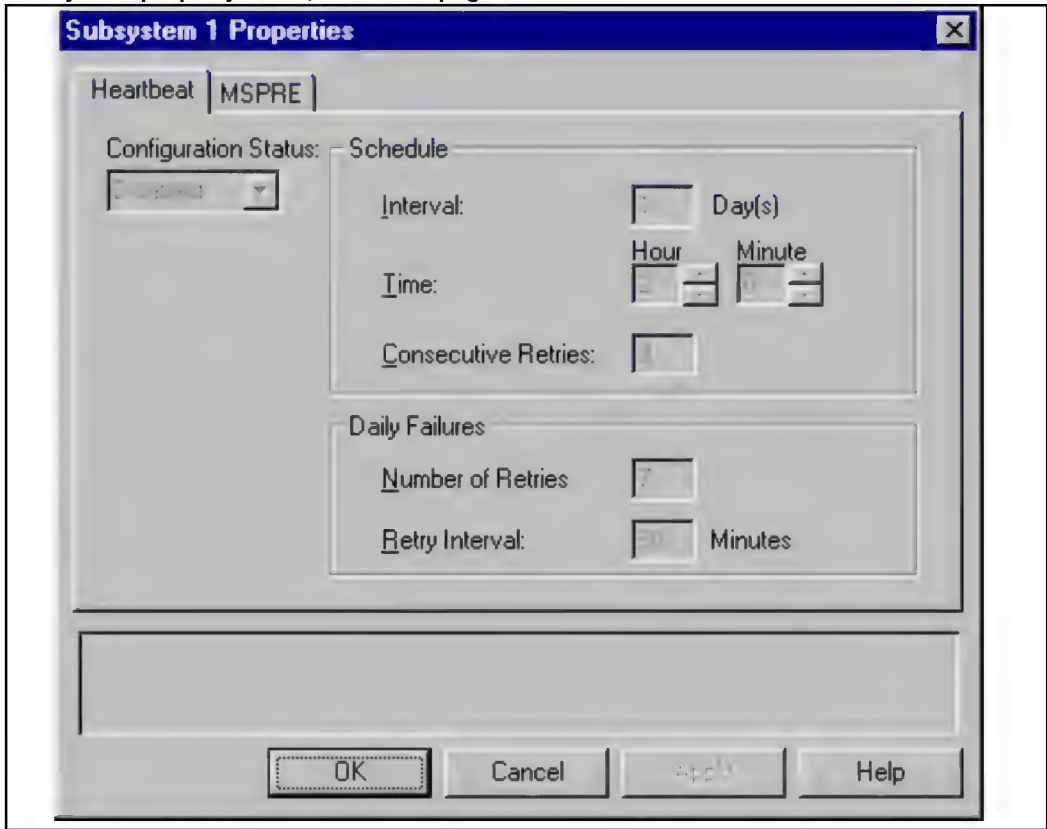
You can use the Subsystem Object Manager to change MSPRE properties for the Microcellular system. Figure 12 illustrates the Subsystem Object Manager window.

Figure 12
Subsystem Object Manager window



From this window, you can choose Properties from the Configuration menu. This opens the Subsystem property sheet, which Figure 13 illustrates.

Figure 13
Subsystem property sheet, Heartbeat page



The Heartbeat page shows the attribute values for the heartbeat that the CMCP sends to the Microcellular system. You cannot change the attribute values on this page. For more information about the CMCP heartbeat, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Figure 14 illustrates the MSPRE page.

Figure 14
Subsystem property sheet, MSPRE page

The screenshot shows a Windows-style dialog box titled "Subsystem 1 Properties". It has two tabs: "Heartbeat" and "MSPRE", with "MSPRE" being the active tab. The dialog contains a "Special Prefix" dropdown menu with a blue icon and a "Defaults" button. Below these is a "Feature Codes" section with a list of features and their corresponding values in text boxes. At the bottom of the dialog are four buttons: "OK", "Cancel", "Apply", and "Help".

Feature Codes:	Value
Call Forward All Calls:	71
Call Forward All Calls Cancel:	710
Call Park:	77
Call Park Retrieve:	770
Speed Call:	78
Centrex Switchhook:	96

You can configure the following MSPRE attribute values for the Microcellular system:

- | | |
|-------------------------------|---|
| Special Prefix | The character that must precede all feature activation/deactivation codes.
Values: *, #, 1-9, None
Default value: * |
| Call Forward All Calls | Call Forward activation code, up to four digits long.
Default value: 71 |
| Call Forward All Calls Cancel | Call Forward activation code, up to four digits long.
Default value: 710 |
| Call Park | Call Park activation code, up to four digits long.
Default value: 77 |
| Call Park Retrieve | Call Park Retrieve code, up to four digits long.
Default value: 770 |
| Speed Call | Speed Call code, up to four digits long.
Default value: 78 |
| Centrex Switchhook | Centrex Switchhook code, up to four digits long.
Default value: 96 |

The Defaults button restores the default values.

EIMC administration

An Embedded Intelligent Mobility Controller (EIMC) is responsible for processing a particular wireless standard's protocol. Because each wireless protocol supports different features, an EIMC provides an abstract interface to these protocols.

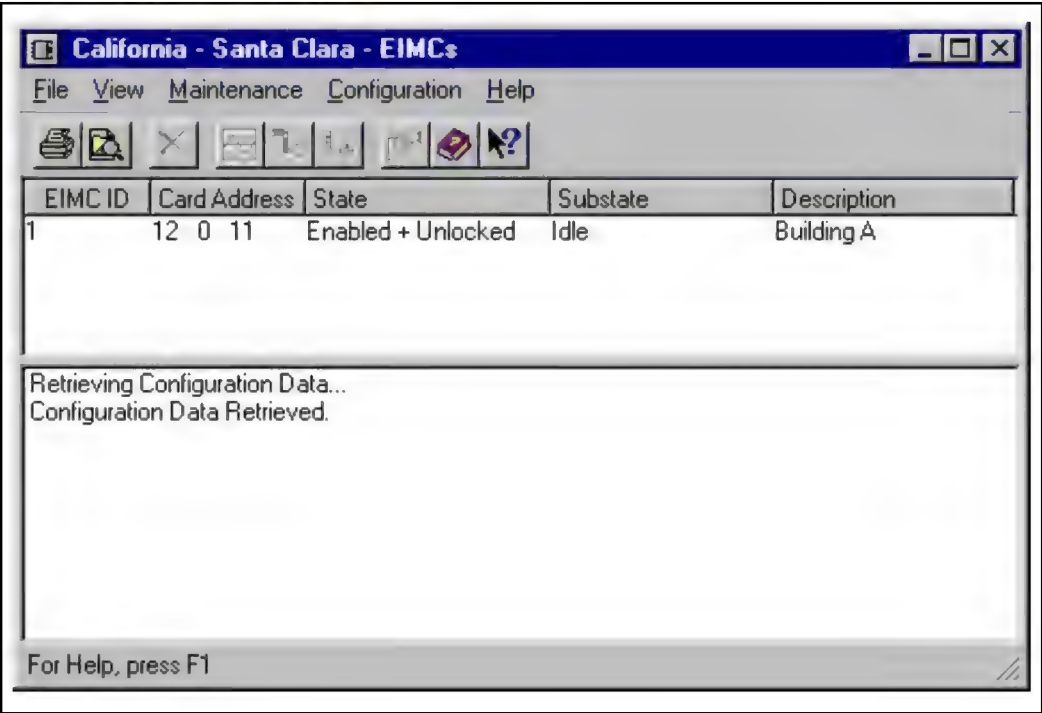
The key management functions supported for EIMCs are as follows:

- Adding, changing, and deleting EIMCs
- Testing, locking, and unlocking EIMCs

Use the EIMC Object Manager to manage EIMCs. You cannot create an EIMC object until its parent MISP object exists. Before you can delete an EIMC object, you must delete its child MXC objects.

The EIMC Object Manager window lists all configured EIMCs in the system and provides access to the status and properties for each. See Figure 15.

Figure 15
EIMC Object Manager window



EIMC Object Manager menus

The EIMC Object Manager supports the following menus.

<u>F</u>ile	
<u>P</u>rint	Ctrl+P
Print Preview	
Print Setup...	
<u>R</u>eports...	Ctrl+R
Properties	
<u>C</u>lose	

<u>E</u>dit	
<u>C</u>opy	Ctrl+C
<u>S</u>elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u>oolbar	
√ <u>S</u>tatus Bar	

Maintenance
<u>L</u> ock
<u>U</u> nlock
<u>T</u> est

Configuration
<u>A</u> dd EIMC...
<u>D</u> elete EIMC

Help	
Help <u>T</u> opics	F1
<u>W</u> hat's This?	Shift + F1
<u>A</u> bout EIMCs	

EIMC Object Menu

<u>L</u> ock	
<u>U</u> nlock	
<u>T</u> est	
<u>D</u> elete	
Properties	
<u>W</u> hat's This?	Shift+F1

For descriptions of menu commands and actions, see Table 3 on page 27.

EIMC property sheet and Configuration page

Figure 16 illustrates the EIMC property sheet and Configuration page for Option 51C, 61C, 81, or 81C.

Figure 16

EIMC property sheet, Configuration page (Option 51C, 61C, 81, or 81C)

The screenshot shows a window titled "EIMC 1 Properties" with a "Configuration" tab selected. The window contains the following fields:

- MISP ID:** A text box containing the value "1".
- Description:** A text box containing the value "Building A".
- Card address:** A section with three sub-fields: "Loop" (containing "12"), "Shelf" (containing "0"), and "Card" (containing "11").

At the bottom of the window are four buttons: "OK", "Cancel", "< Back", and "Help".

Figure 17 illustrates this sheet and page for Option 11C.

Figure 17
EIMC property sheet, Configuration page (Option 11C)

The screenshot shows a Windows-style dialog box titled "EIMC 1 Properties" with a close button (X) in the top right corner. The "Configuration" tab is selected, indicated by a vertical line on the left. The dialog contains two text input fields: "Description" with the value "Building A" and "Card address" with the value "5". The "Card address" field has a small "Slot" label above it. At the bottom of the dialog are four buttons: "OK", "Cancel", "Apply", and "Help".

For Option 51C, 61C, 81, or 81C, you can configure the following EIMC attribute values:

- | | |
|--------------|---|
| Description | Up to 30 alphanumeric characters that describe the EIMC.
Example: Eimc 1, Buildings A/B/C |
| Card Address | Numeric characters that specify the loop (0-158), shelf (0-1), and IPE card slot (0-15) where the EIMC resides.
Example: 12 0 11 |

For Option 11C, you can configure the following EIMC attribute values:

Description	Up to 30 alphanumeric characters that describe the EIMC. Example: 51b
Card Address	Numeric characters that specify the card slot (1-10) in which the EIMC resides in the main cabinet. Example: 4

MXC administration

A Microcellular Transcoder Card (MXC) is responsible for transcoding voice. Each MXC serves up to eight TRU-IIs and can be configured on the same IPE shelf as other non-Microcellular cards.

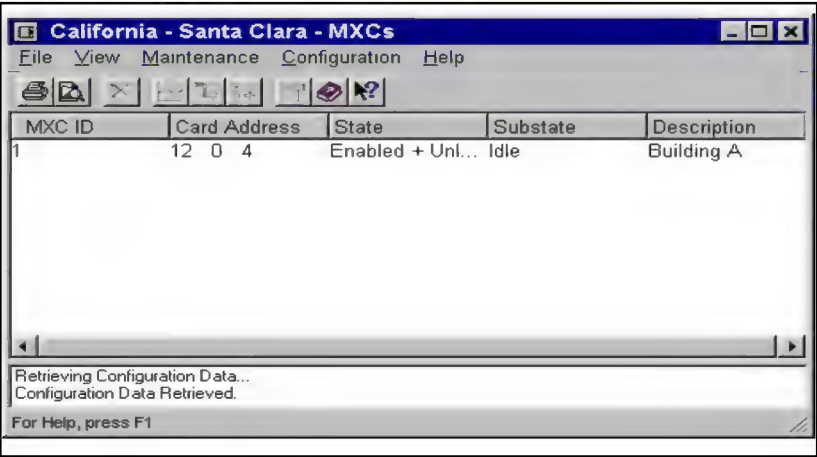
The key management functions supported for MXCs are as follows:

- Adding, changing and deleting MXCs
- Locking and unlocking MXCs

Use the MXC Object Manager to manage MXCs. You cannot create an MXC until its parent EIMC exists. Before you delete an MXC, you must delete its child MBS objects.

The MXC Object Manager window lists all configured MXCs in the system, and provides access the status and other properties of each. See Figure 18.

Figure 18
MXC Object Manager



MXC Object Manager menus

<u>F</u>ile	
<u>P</u> rint	Ctrl+P
Print Pre <u>u</u>	
Print Set <u>u</u> p...	
<u>R</u> eports...	Ctrl+R
<u>P</u>roperties	
<u>C</u> lose	

<u>E</u>dit	
<u>C</u> opy	Ctrl+C
<u>S</u> elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u> oolbar	
√ <u>S</u> tatus Bar	

<u>M</u>aintenance	
<u>L</u> ock	
<u>U</u> nlock	
<u>T</u> est	

<u>C</u>onfiguration	
<u>A</u>dd MXC...	TDMA-VSELP
<u>D</u>elete MXC	TDMA-EFRC/VSELP

<u>H</u>elp	
<u>H</u>elp <u>T</u>opics	F1
<u>W</u>hat's This?	Shift + F1
<u>A</u>bout MXCs	

MXC Object Menu

<u>L</u>ock
<u>U</u>nlock
<u>T</u>est
<u>D</u>elete
Properties
<u>W</u>hat's This?

For descriptions of menu commands and actions, see Table 3 on page 27.

MXC property sheet and Configuration page

Figure 19 illustrates the MXC property sheet and Configuration page for an Option 51C, 61C, 81, or 81C system.

Figure 19

MXC property sheet, Configuration page (Option 51C, 61C, 81, or 81C)

The screenshot shows a Windows-style dialog box titled "MXC 1 Properties". The "Configuration" tab is selected. The dialog contains the following fields:

- EIMC ID:** A text box containing the value "1".
- Description:** A text box containing the value "efrc/4".
- Card address:** A section with three sub-fields: "Loop" (value 12), "Shelf" (value 0), and "Card" (value 4).
- Transcoder mode:** A dropdown menu currently showing "T... EFP... ELP".

At the bottom of the dialog are four buttons: "OK", "Cancel", "Help", and a button with a question mark icon.

Figure 20 illustrates the MXC property sheet and Configuration page for an Option 11C system.

Figure 20
MXC property sheet, Configuration page (Option 11C)

The screenshot shows a Windows-style dialog box titled "MXC 1 Properties". It has a tab labeled "Configuration". Inside the dialog, there are four labeled input fields: "EIMC ID" with the value "1", "Description:" with the value "vselp", "Card address:" with the value "0", and "Transcoder mode:" with a dropdown menu showing "TUNING". At the bottom of the dialog are four buttons: "OK", "Cancel", "Help", and a disabled button with a question mark icon.

For Option 51C, 61C, 81, or 81C, you can configure the following MXC attribute values:

- | | |
|--------------|---|
| EIMC ID | The number of the parent EIMC for the MXC. The Microcellular system numbers the EIMCs in installation order, from 1 to 8.
Example: 1 |
| Description | Up to 30 alphanumeric characters that describe the MXC. Example: Buildings B & C |
| Card Address | Numeric characters that specify the loop (0-158), shelf (0-1), and IPE card slot (0-15) where the MXC resides.
Example: 12 0 4 |

For Option 11C, you can configure the following MXC attribute values:

EIMC ID	The number of the parent EIMC for the MXC. The Microcellular system numbers the EIMCs in installation order, from 1 to 8. Example: 2
Description	Up to 30 alphanumeric characters that describe the MXC. Example: MXC for MBS 2
Card Address	Numeric characters that specify the card slot (1-30) where the MXC resides in the main cabinet. Example: 5

Transcoder mode, a read-only field on the MXC Configuration page, specifies whether the MXC provides both ACELP and VSELP service (TDMA-EFRC/VSELP) or VSELP only service (TDMA-VSELP).

For information on upgrading from a VSELP system to an ACELP/VSELP system, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Zone administration

A zone is a logical Microcellular component that represents a geographic coverage area made up of smaller coverage areas (cells). A single EIMC serves each zone.

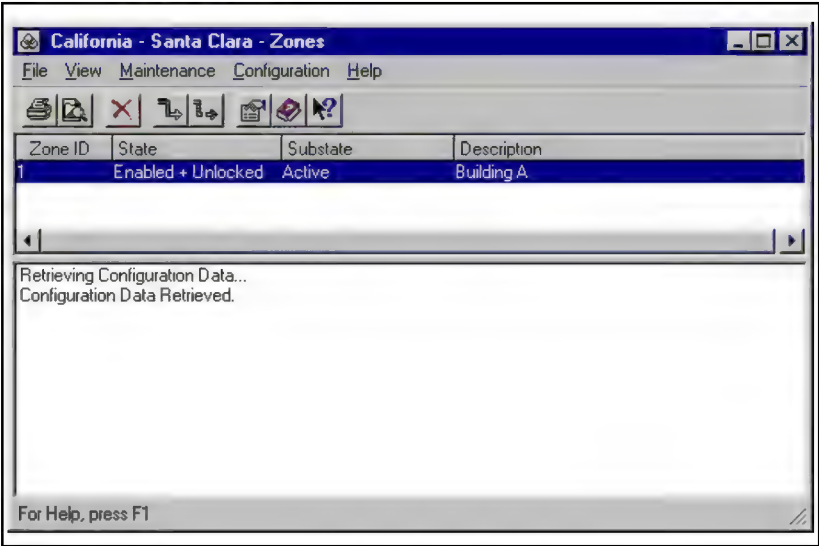
The key management functions supported for zones are as follows:

- Adding, changing and deleting zones
- Locking and unlocking zones

Use the Zone Object Manager to manage zones. You cannot create a zone object until its parent EIMC object exists. Before you delete a zone object, you must delete its child cell objects.

The Zone Object Manager window lists all configured Microcellular zones in the system and provides access to the status and properties for each. See Figure 21.

Figure 21
Zone Object Manager



Zone Object Manager menus

The Zone Object Manager supports the following menus:

<u>F</u>ile	
<u>P</u>rint	Ctrl+P
Print Preview	
Print Setup...	
<u>R</u>eports...	Ctrl+R
Properties	
<u>C</u>lose	

<u>E</u>dit	
<u>C</u>opy	Ctrl+C
<u>S</u>elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u>oolbar	
√ <u>S</u>tatus Bar	

Maintenance
<u>L</u> ock
<u>U</u> nlock

Configuration
<u>A</u> dd Zone...
<u>D</u> elete Zone

Help	
Help <u>T</u> opics	F1
<u>W</u> hat's This?	Shift + F1
<u>A</u> bout Zones	

Zone Object Menu

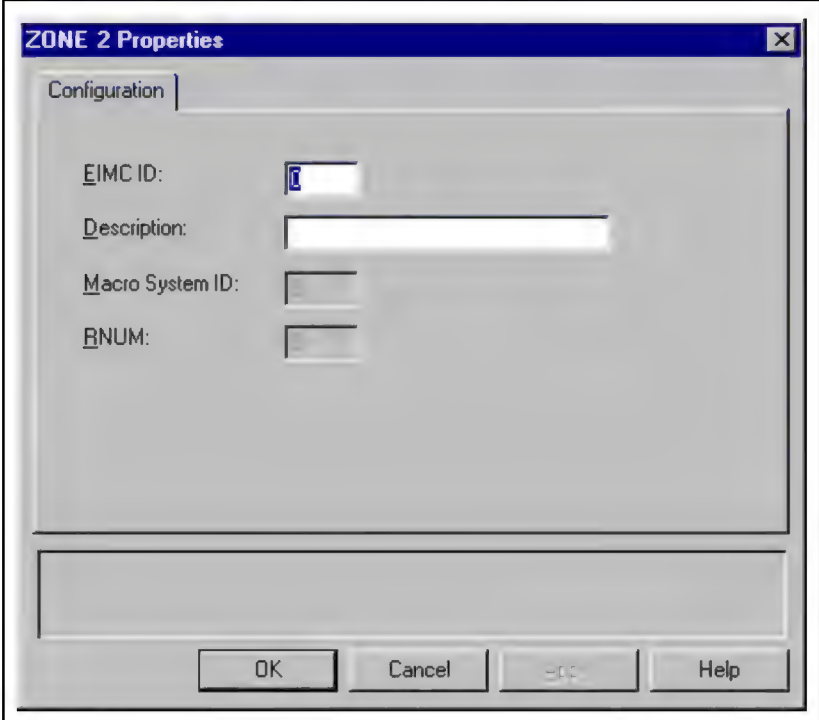
<u>L</u> ock	
<u>U</u> nlock	
<u>D</u> elete	
Properties	
<u>W</u> hat's This?	Shift+F1

For descriptions of menu commands and actions, see Table 3 on page 27.

Zone property sheet and Configuration page

Figure 22 illustrates the Zone property sheet and Configuration page for the IS-136 protocol.

Figure 22
IS-136 Zone property sheet, Configuration page



The screenshot shows a Windows-style dialog box titled "ZONE 2 Properties" with a close button (X) in the top right corner. The "Configuration" tab is selected, indicated by a vertical bar. The dialog contains four input fields with labels to their left: "EIMC ID:" followed by a small text box, "Description:" followed by a larger text box, "Macro System ID:" followed by a small text box, and "RNUM:" followed by a small text box. At the bottom of the dialog, there are four buttons: "OK", "Cancel", "Help", and a button with a question mark icon.

Figure 23 illustrates the Zone property sheet and Configuration page for the IS-54B protocol.

Figure 23
IS-54B Zone property sheet, Configuration page

The screenshot shows a Windows-style dialog box titled "ZONE 2 Properties" with a close button (X) in the top right corner. The "Configuration" tab is selected, indicated by a vertical bar on the left. The dialog contains four labeled text input fields: "EIMC ID:" with the value "1", "Description:" with the value "Building A", "Macro System ID:" which is empty, and "Location ID:" which is empty. At the bottom of the dialog are four buttons: "OK", "Cancel", "Apply", and "Help".

You can configure the following Zone attribute values:

- | | |
|-------------|--|
| EIMC ID | The number of the parent EIMC for the zone. The Microcellular system numbers the EIMCs in installation order, from 1 to 8.
Example: 1 |
| Description | Up to 30 alphanumeric characters that describe the physical location covered by the zone.
Example: Buildings A/B/C |

The cellular operator configures the Macro System ID, RNUM, and Location ID (IS-54B) attribute values from the CMCP. For information about zone configuration from the CMCP, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Cell administration

A cell is a logical Microcellular component that represents a geographic coverage area that a Microcellular system services.

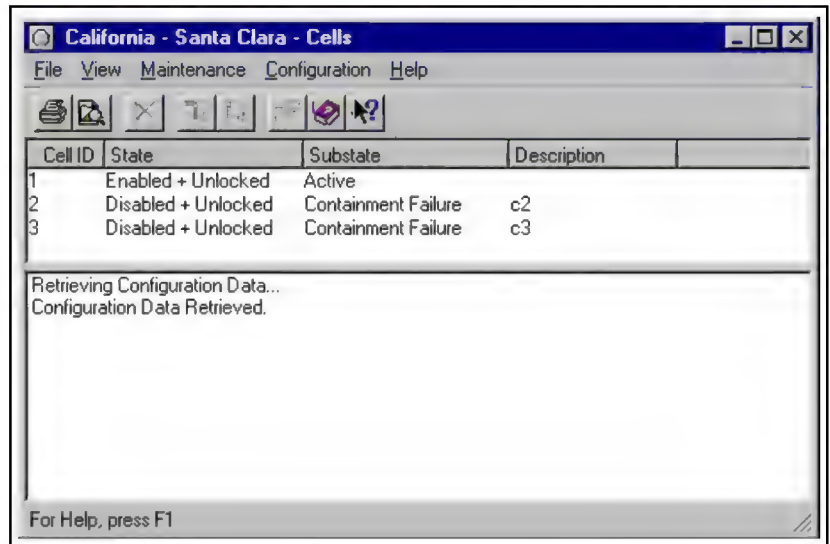
The key management functions supported for cells are as follows:

- Adding, changing, and deleting cells
- Locking and unlocking cells

Use the Cell Object Manager to manage cells. You cannot add a cell until its parent zone exists. Before you delete a cell, you must delete its child MBS objects.

The Cell Object Manager window lists all configured cells in the system and provides access to the status and other properties of each. See Figure 24.

Figure 24
Cell Object Manager



Cell Object Manager menus

The Cell Object Manager supports the following menus:

<u>F</u>ile	
<u>P</u>rint	Ctrl+P
Print Preview <u>u</u>	
Print Setup...	
<u>R</u>eports...	Ctrl+R
Propert <u>i</u> es	
<u>C</u>lose	

<u>E</u>dit	
<u>C</u>opy	Ctrl+C
<u>S</u>elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u>oolbar	
√ <u>S</u>tatus Bar	

Maintenance
<u>L</u> ock
<u>U</u> nlock

Configuration	
<u>A</u> dd Cell...	IS-136
<u>D</u> elete Cell	IS-54B
<u>N</u> eighbor Cells...	

Help	
Help <u>T</u> opics	F1
<u>W</u> hat's This?	Shift + F1
<u>A</u> bout Cells	

Object Menu

<u>L</u> ock
<u>U</u> nlock
<u>D</u> elete
Properties
<u>W</u> hat's This? Shift+F1

For descriptions of menu commands and actions, see Table 3 on page 27.

Cell property sheet and pages

Figure 25 illustrates the Cell property sheet for the IS-136 protocol. Each page on the property sheet displays cell attribute values. You can configure attribute values for cells only on the Configuration page.

Figure 25
IS-136 Cell property sheet, Configuration page

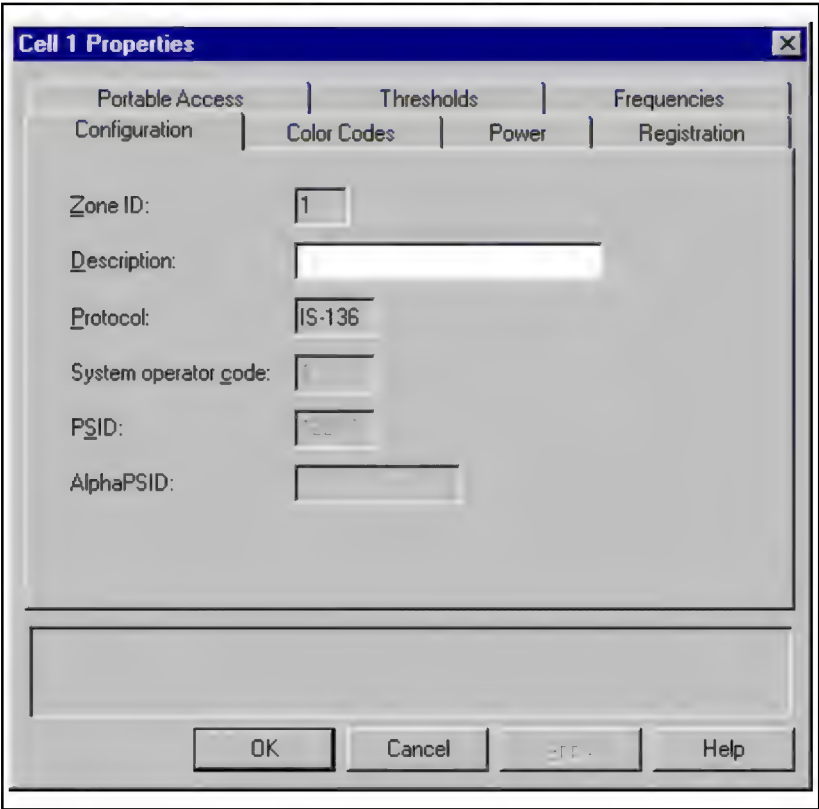


Figure 26 illustrates the Cell Configuration page for the IS-54B protocol.

Figure 26
IS-54B Cell property sheet, Configuration page

The screenshot shows a Windows-style dialog box titled "Cell 1 Properties" with a close button (X) in the top right corner. The dialog has a tabbed interface with the following tabs: "Portable Access", "Thresholds", "Frequencies", "Configuration" (which is the active tab), "Color Codes", "Power", and "Registration". The "Configuration" tab contains three labeled input fields: "Zone ID:" with a text box containing the number "1", "Description:" with a text box containing "Building A", and "Protocol:" with a text box containing "IS-54B". At the bottom of the dialog, there are four buttons: "OK", "Cancel", "Apply", and "Help".

You can configure the following attribute values for the cell on the cell property sheet Configuration page:

Zone ID	The numeric ID of the parent zone for the cell. The Microcellular system numbers zones in the order in which zone objects are added, from 1 to 8. Example: 1
Description	Up to 30 alphanumeric Characters that describe the cell. Example: Cell 1
Protocol	The common air interface (CAI) protocol for the cell. Enter IS-136 or IS-54B. CTS name: mode Default: IS-136.

The cellular operator configures the System operator code, PSID, and Alpha PSID attribute values that appear on the Configuration page. System operator code, PSID, and Alpha PSID apply only to an IS-136 cell and do not appear on the Configuration page for an IS-54B cell.

The cellular operator also configures the Color Codes, Power, Registration, Portable Access, Thresholds, and Frequencies property pages. When the cellular operator completes the configuration, you need to unlock the cell.

For information about cell configuration from the CMCP and unlocking cells, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Neighbor cells and external cells

The cellular operator configures neighbor cells and external cells. External cells represent macrocell or microcell systems that exist outside the Microcellular system. The external cell configuration is necessary for the configuration of neighbor cells for internal cells. Neighbor cells enable the system to handoff active calls as portables move from one cell to the next.

For more information about the configuration of neighbor cells and external cells, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

MBS administration

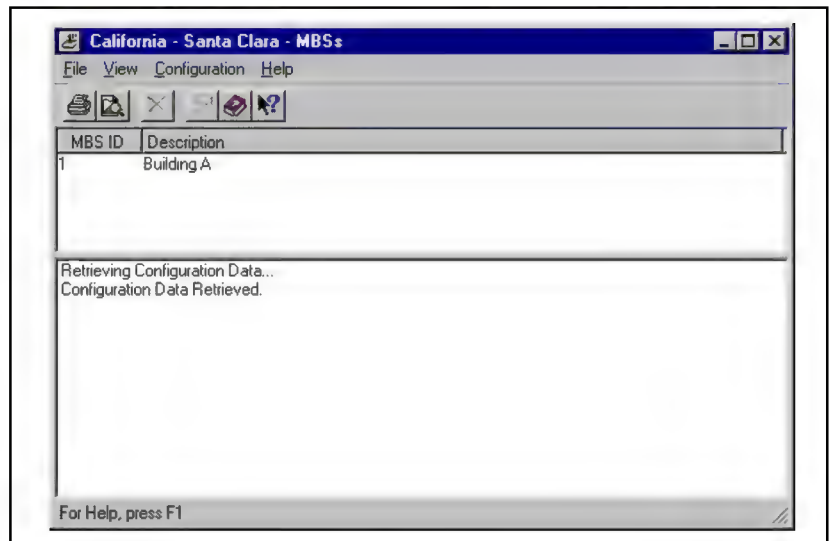
A Microcellular Base Station (MBS) is a housing that contains TRU-IIs (radios). The number of TRU-IIs equipped in an MBS depends on Microcellular system deployment. Each MBS supports up to four TRU-IIs.

The key management functions supported for MBSs are adding, changing, and deleting MBS objects.

Use the MBS Object Manager to manage MBSs. You cannot add an MBS until its parent MBX and Cell exist. Before you can delete an MBS object, you must delete its child radio objects.

The MBS Object Manager window lists all configured MBSs in the system and provides access to the status and properties for each. See Figure 27.

Figure 27
MBS Object Manager



MBS Object Manager menus

The MBS Object Manager supports the following menus.

<u>F</u>ile	
<u>P</u> rint	Ctrl+P
Print Preview <u>u</u>	
Print Setup...	
<u>R</u> eports...	Ctrl+R
<u>P</u>roperties	
<u>C</u> lose	

<u>E</u>dit	
<u>C</u> opy	Ctrl+C
<u>S</u> elect All	Ctrl+A

<u>V</u>iew	
☒ <u>T</u> oolbar	
☒ <u>S</u> tatus Bar	

<u>C</u>onfiguration	
<u>A</u> dd MBS...	
<u>D</u> elete MBS	

Help	
Help <u>T</u> opics	F1
<u>W</u> hat's This?	Shift + F1
About MBS	

MBS Object Menu

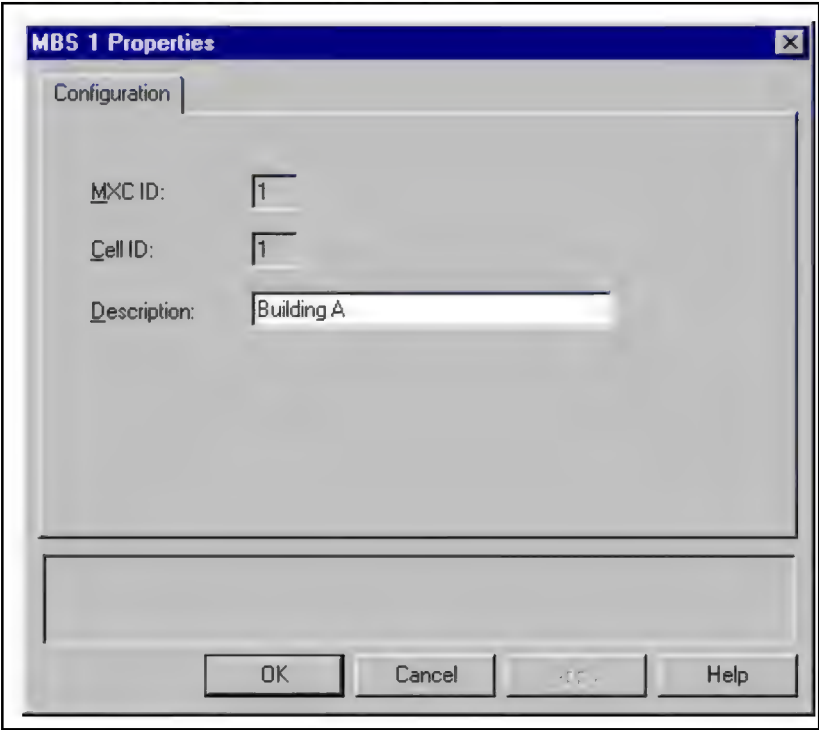
<u>D</u> elte	
Properties	
<u>W</u> hat's This?	Shift+F1

For descriptions of menu commands and actions, see Table 3 on page 27.

MBS property sheet and Configuration page

Figure 28 illustrates the MBS property sheet and Configuration page.

Figure 28
MBS property sheet, Configuration page



You can configure the following MBS attribute values:

MXC ID	The number of the parent MXC for the MBS. The Microcellular system numbers the MXCs in installation order, from 1 to 15. Example: 1
Cell ID	The number of the parent cell for the MBS. The Microcellular system numbers the cells in installation order, beginning with 1. Example: 1
Description	Up to 30 alphanumeric characters that describe the MBS. Example: Building C.

Radio administration

A TRU-II (radio) and its associated antennas provide air access for Microcellular portables. Each TRU-II can operate as a control or traffic radio (TDMA-3).

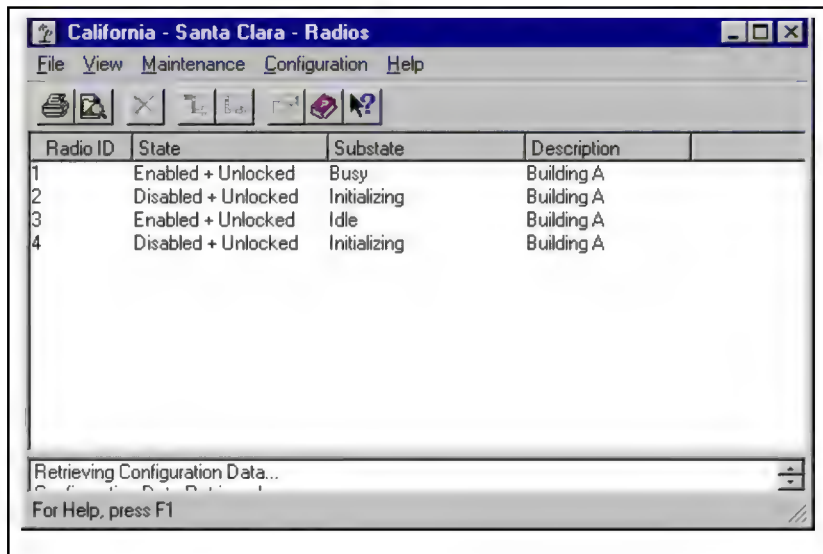
The key management functions supported for TRU-II are as follows:

- Adding, changing and deleting radios
- Locking and unlocking radios
- Invoking radio self-tests

Use the Radio Object Manager to manage TRU-IIs. You cannot create a radio object until its parent Base Station (MBS) object exists.

The Radio Object Manager window, which Figure 29 illustrates, lists all configured radios in the system and the status of each. You can access the properties for each TRU-II from this window.

Figure 29
Radio Object Manager



Radio Object Manager menus

The Radio Object Manager supports the following menus.

<u>F</u>ile	
<u>P</u>rint	Ctrl+P
Print Preview <u>u</u>	
Print Setup...	
<u>R</u>eports...	Ctrl+R
Propert <u>i</u> es	
<u>C</u>lose	

<u>E</u>dit	
<u>C</u>opy	Ctrl+C
<u>S</u>elect All	Ctrl+A

<u>V</u>iew	
√ <u>T</u>oolbar	
√ <u>S</u>tatus Bar	

Maintenance
<u>L</u> ock
<u>U</u> nlock
<u>F</u> orced Download

<u>C</u>onfiguration
<u>A</u> dd Radio...
<u>D</u> elete Radio

Radio Object Menu

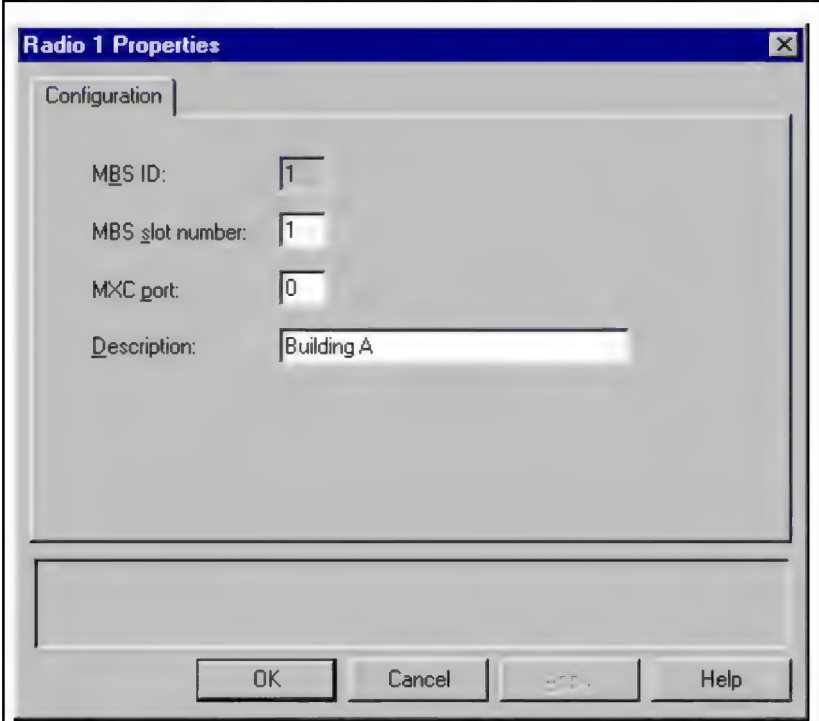
<u>L</u> ock
<u>U</u> nlock
<u>F</u> orced Download
<u>D</u> elete
Properties...
<u>W</u> hat's This?...

For descriptions of menu commands and actions, see Table 3 on page 27.

Radio property sheet and Configuration page

Figure 30 illustrates the radio property sheet and Configuration page.

Figure 30
Radio property sheet, Configuration page



The image shows a Windows-style dialog box titled "Radio 1 Properties". It has a tab labeled "Configuration". Inside the dialog, there are four labeled input fields: "MBS ID:" with a text box containing "1", "MBS slot number:" with a text box containing "1", "MXC port:" with a text box containing "0", and "Description:" with a text box containing "Building A". At the bottom of the dialog, there are four buttons: "OK", "Cancel", "Help", and a disabled button with an ellipsis "...".

MBS ID:	1
MBS slot number:	1
MXC port:	0
Description:	Building A

Buttons: OK, Cancel, Help, ...

You can configure the following radio attribute values:

MBS ID	The number of the parent MBS for the radio. The Microcellular system numbers the MBSs in installation order, beginning with 1. Example: 1
MBS slot number	The MBS slot in which the TRU-II radio resides, from 1 to 4. Example: 1
MXC port	The port on the parent MXC to which the radio is connected, from 0 to 7 (the MXC that is the parent of the radio's parent MBS). Example: 0
Description	Up to 30 alphanumeric characters that describe the radio. Example: Radio 1 - Building C.

To add a radio, see the installation instructions in the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

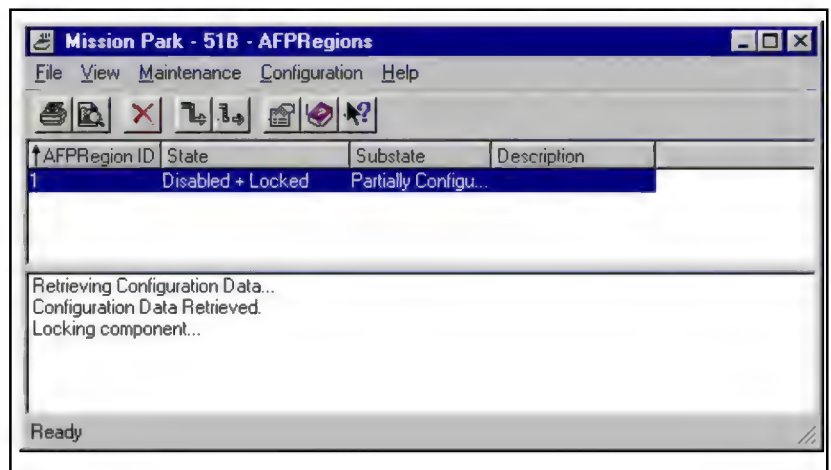
AFP region and AFP Station administration

The AFP region is a logical Microcellular component that is the parent of one or more AFP Stations. The key management functions supported for the AFP region is as follows:

- Adding, changing, and deleting AFP Stations
- Locking and unlocking the AFP region

Use the AFP Region Object Manager to manage the AFP region. The AFP Region Object Manager window displays the state and substate of the AFP region for the Microcellular system and provides access to the region properties and to AFP Station configuration. See Figure 31.

Figure 31
AFP Region Object Manager



AFP Region Object Manager menus

The AFP Region Object Manager supports the following menus:

File	
Print	Ctrl+P
Print Preview	
Print Setup...	
Reports...	Ctrl+R
Properties	
Close	

View	
√	Toolbar
√	Status Bar

Maintenance	
	Lock
	Unlock

Help	
Help Topics	F1
What's This?	Shift + F1
About the AFP Region	

Object Menu

Lock	
Unlock	
What's This?	Shift+F1

For descriptions of menu commands and actions, see Table 3 on page 27.

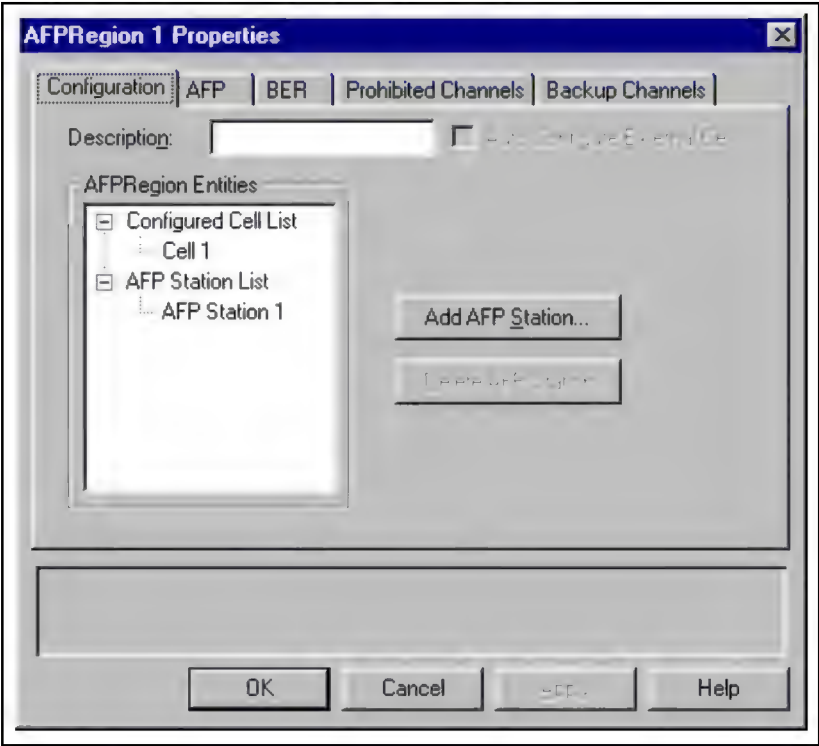
AFP Region property sheet and pages

Figure 32 illustrates the AFP Region property sheet. Each page on the property sheet displays AFP region attribute values. You can configure attribute values for the AFP region only on the Configuration page. You can view the list of prohibited channels that the cellular operator entered and the usable backup channels that AFP selects.

You can configure the following attribute value for the AFP region on the Configuration page:

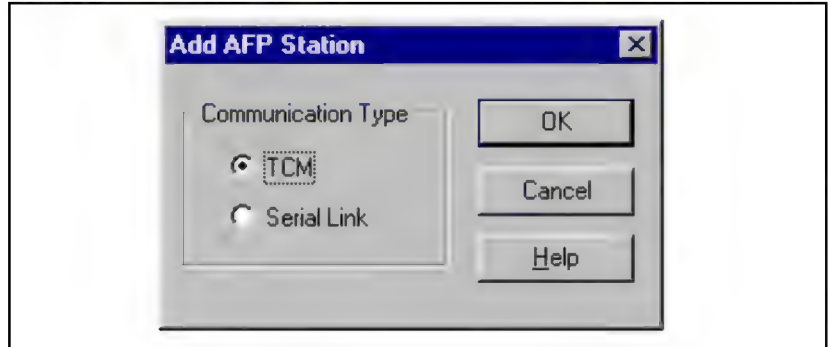
Description	Up to 30 alphanumeric Characters that describe the cell. Example: Cell 1
-------------	---

Figure 32
AFP Region property sheet, Configuration page



You can also add and delete AFP Station objects from the Configuration page. Click the Add AFP Station button to add and configure an AFP Station. The Add AFP Station dialog box appears, as Figure 33 illustrates.

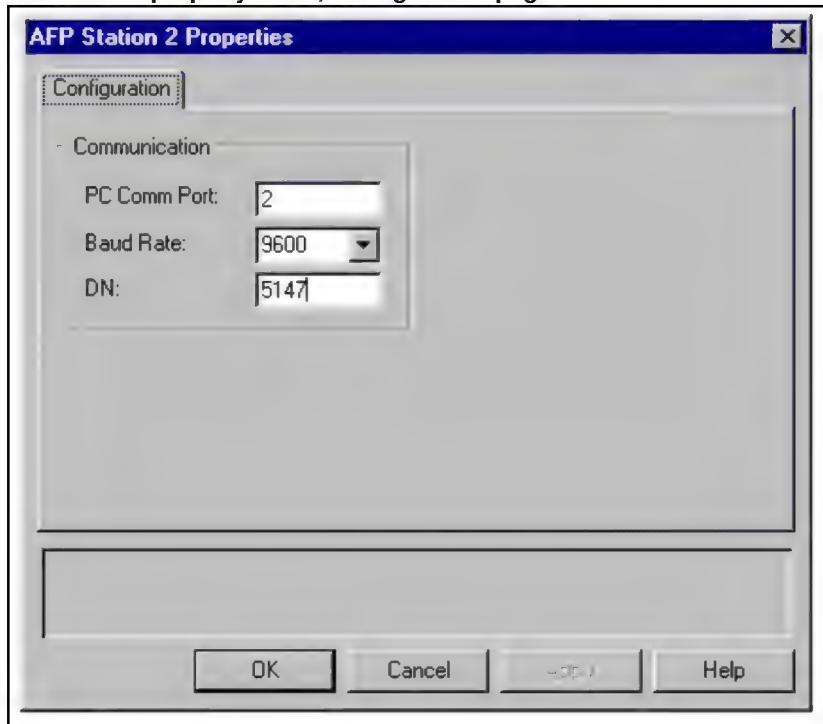
Figure 33
Add AFP Station dialog box



Select the type of communications link between the APF station and the MSM MAT. If the AFP station connects to the MAT through TCM cable and a Meridian Communications Unit, click TCM. If the AFP station connects through short-haul modems and telephone cable, click Serial Link. Then click OK.

The object manager adds an AFP Station object and opens the AFP Station property sheet, which Figure 34 illustrates.

Figure 34
AFP Station property sheet, Configuration page



For a TCM connection between an AFP Station and the local MSM MAT, specify values for the following attributes:

- | | |
|-----------|--|
| Baud Rate | The data rate at which AFP software communicates with AFP Stations.
Default value: 9600 |
| DN | The directory number of the DLC port to which the AFP Station connects on the Meridian 1 system. |

For a serial connection between an AFP Station and the local MSM MAT, specify values for the following attributes:

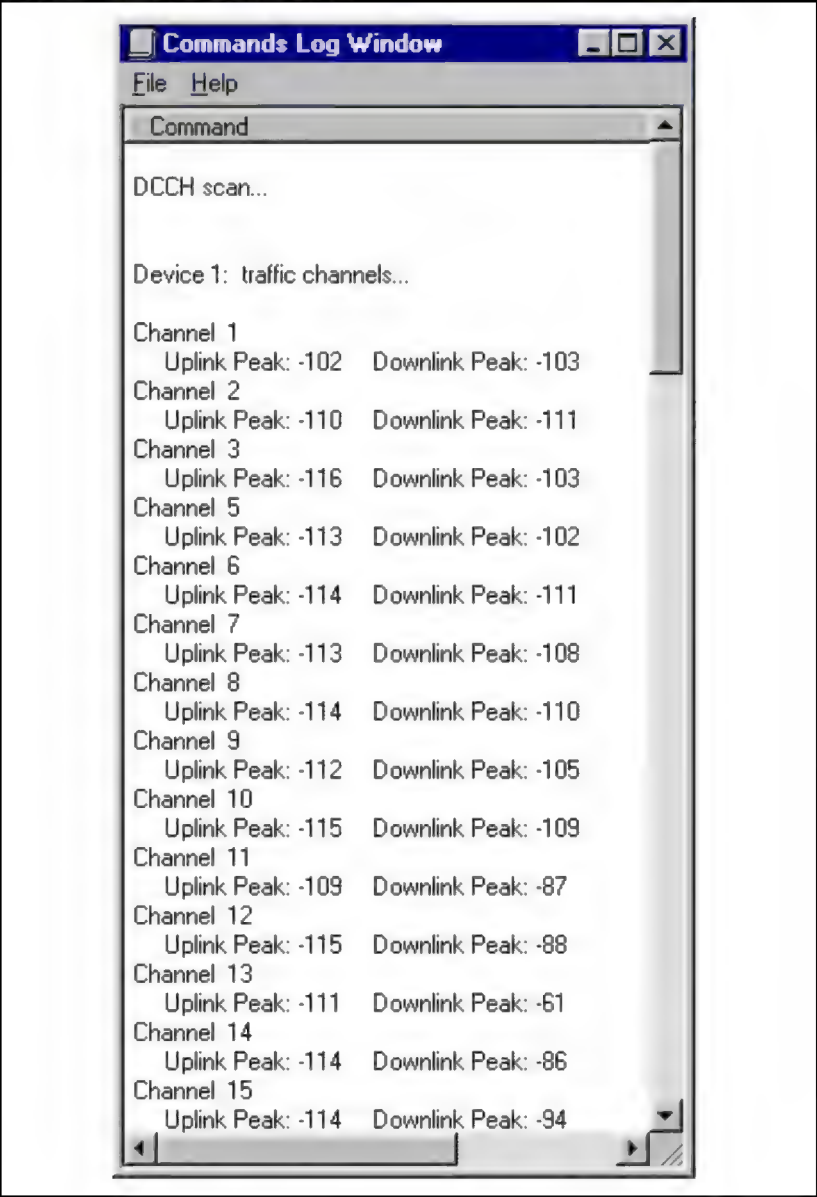
- | | |
|--------------|---|
| PC Comm Port | The PC serial communications port on the local MAT, from 1 to 7, through which AFP software communicates with AFP Stations.
Default value: 2 |
| Baud Rate | The data rate at which AFP software communicates with AFP Stations.
Default value: 9600 |

The cellular operator configures the AFP and Prohibited Channels property pages for the AFP region. For information about unlocking the AFP region and AFP convergence, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

AFP RSSI measurements

To view the AFP RSSI measurements for the region, press ALT-L in the AFP Region Object Manager windows. This opens the Commands Log window, which Figure 35 illustrates.

Figure 35
AFP Commands Log window



Object deletions

You might need to delete a Microcellular component through the object manager and reconfigure the component. Before you can delete an object, you need to delete any child objects from MSM. If you are replacing the parent object, you can add the child objects back after the replacement. For information about parent and child objects, see “Configuration order for Microcellular objects” on page 13.

To delete a Microcellular object from MSM, perform the following procedure on the MSM MAT:

- 1** Open the object manager from the System window by double clicking the icon for the type of object.
- 2** Lock the object by highlighting it in the object list and choosing Lock from the Maintenance menu.
- 3** Choose Delete from the object manager Configuration menu.

For example, to delete a radio object so that you can replace the corresponding TRU-II in an MBS slot, open the Radio Object Manager. In the Radio Object Manager window, select the radio object, lock it, and then choose Delete from the Configuration menu.

The object manager displays a confirmation dialog so that you can cancel the command if you want to. If the object manager cannot delete an object, perhaps because it is currently referenced by another object, the object manager displays an error message.

The object manager displays a confirmation dialog so that you can cancel the command if you want to. If the object manager cannot delete an object, perhaps because it is currently referenced by another object, the object manager displays an error message.

Monitoring Operational Measurements

Operational Measurements (OMs) provide information that you can use to evaluate the performance of a system. Several OMs are available for the Microcellular system. These OMs can be scheduled and output like other Meridian 1 OM reports.

Table 8 lists the Microcellular-specific OMs. This table also provides an example that illustrates a typical report.

Table 8
Microcellular Operational Measurements

Format						
System ID	TFSxxx					
MISP: loop number						
EIMC: card address CELL: cell number						
	origination attempts	origination completions	termination attempts	termination completions	page attempts	call drops
	handoff attempts	handoff completions	capacity reached			
Example						
0423	TFS011					
MISP: 008						
EIMC: 012 0 11	CELL: 01					
	00005	00005	00002	00002	00010	00000
	00005	00005	00000			

Table 9 describes each of the Microcellular operational measurements.

Table 9
Operational Measurement descriptions

Operational Measurement	Description
Origination attempts	Number of originations attempted from a portable on this cell.
Origination completions	Number of originations successfully completed on this cell.
Termination attempts	Number of attempts to terminate a call to a portable on this cell.
Termination completions	Number of terminations successfully completed on this cell.
Page attempts	Number of page messages sent from this cell.
Call drops	Number of active calls dropped on this cell.
Handoff attempts	Number of handoffs attempted from this cell to an adjacent cell.
Handoff completions	Number of handoffs successfully completed.
Capacity reached	Number of times this cell has reached capacity (all radios busy).

For more information about Operational Measurements, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Troubleshooting and maintenance

This section describes how to solve problems quickly by isolating and replacing faulty Field Replaceable Units (FRUs). This section contains troubleshooting and maintenance information for the following Microcellular hardware:

- Microcellular Base Stations (MBSs)
- TRU-IIs
- Alarm and Power Supply module (APS)
- Antenna Matrix/Compact Simplex Master Oscillator (CSMO)
- Portables
- Field Replaceable Units (FRUs)

For information about Microcellular system messages and alarms, including AFP alarms, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Microcellular Base Station problems

A problem with a MBS is likely if any of the following occurs:

- A major or critical alarm at the Meridian 1 system
- Reports of poor quality or dropped calls from users (though these may also be caused by problems with portables)

Only two alarms per MBS can be generated at the MSM MAT (one major and one critical). Generation of either of these alarms could be the result of one of a number of failures. For this reason, explicit reasons for a failure are not given at the MAT.

Table 10 lists the alarms that can be generated at the MBS and the severity that is eventually reported at the MSM MAT for each. The equivalent LED on the Alarm and Power Supply (APS) unit is also indicated. Refer to the section called “APS testing” on page 94 for more information on LEDs on the APS.

Table 10
Summary of alarm information

Alarm	Local indication			Remote indication Category
	Category	APS Label	LED status	
CSMO† warm-up	Major	“Osc Warm-up”	Red on	Major
CSMO level	Critical	“Osc Fault”	Red on	Major
Ext. Major input	Major	“Major I/P”	Red on	Major
Fan failure	Major	“Fan Fail”	Red on	Major
CSMO Oven	Critical	“Osc Fault”	Red on	Critical
High temperature	Critical	“High Temp”	Red on	Critical
Ext. Critical input	Critical	“Critical I/P”	Red on	Critical
PSU status	Critical	“PSU OK”	Green off	Critical
Note: † The Master Oscillator provides timing for the TRU-Is and adjusts their frequencies.				

Note that CSMO level is indicated locally at the MBS, because a Critical alarm is reported at the Meridian 1 as Major. This is because the Osc Fault LED is used to indicate two types of Oscillator failures, only one of which is actually considered to be Critical (CSMO Oven). For this reason, a Major alarm (involving the Oscillator) reported at the Meridian 1 might actually be reflected as a Critical alarm at the MBS.

Warm-up alarms

The MBS cannot become active after power-up until the Oven Controlled CSMO has warmed up; this usually takes less than 20 minutes. During this interval the AMO generates a major alarm that is forwarded to the MSM MAT. If a major alarm appears at the Meridian 1 and you are **not** certain whether the MBS has undergone a recent power-up (due to testing, troubleshooting, or a brief power outage, for instance), you should wait approximately 20 minutes, clear the alarm from the MAT, and see if the alarm recurs.

If the alarm is generated again, go to the MBS and examine the APS display LEDs. In most instances, this will indicate the nature of the problem.

Fan failure alarms

Fan failures are detected locally by the fan assembly itself. It can detect whether or not the fan is turning. A stationary fan can be caused by an obstruction, seized bearings, an open motor winding, and so on.

It is best to replace a faulty fan assembly as opposed to attempting to repair it. See “Replacing a fan assembly” on page 109. This is a service-impacting alarm.

High temperature alarm

The high temperature alarm is activated when the sensor located in the APS detects that the MBS maximum operating temperature has been exceeded. At this point, the 28V DC PSU output is disabled and a critical alarm is generated. This is a service-impacting alarm.

The alarm can be cleared in either of two ways:

- Allow the MBS to cool down to its high temperature reset threshold (approximately 30°C ambient), at which time the alarm will be cleared automatically.
- Remove power to the APS for at least 1 second. When power is restored, the alarm will be removed provided the temperature is below the alarm cutout temperature. This is easily done by pulling the APS from its MBS slot, waiting a few seconds, and reinserting the APS.

Note: Frequent repetition of this procedure (pulling and replacing a hot APS) is not recommended. It is important to find the cause of a high temperature failure (such as inadequate ventilation or a faulty air conditioning unit) and correct it.

TRU-II failures

A TRU-II can usually detect when it is not operating properly and generates a log signifying this. A TRU-II cannot, however, generate an alarm via the APS—that is, a faulty TRU-II does not generate a major alarm, just an Operational Measurement (OM).

Three conditions indicate a faulty TRU-II in an MBS:

- Many reports of dropped or poor-quality calls on the system in one specific MBS coverage area

To confirm a TRU-II problem, examine the OM's for the number of dropped calls in a cell or visit the site to query the TRU-II fault-report record.

- The TRU-II front panel display indicating a problem

A TRU-II might also fail without generating a log. In this case, you might need to perform TRU-II operational testing to pinpoint the faulty unit.

The front panel of a TRU-II has an eight-character LED display. When the TRU-II is in the InService state, the first three characters from the left show the current setting of the TRU-II:

ALR	Analog Locate Receiver
ACC	Analog Control Channel
TTC	TDMA (digital) Traffic Channel
TLR	TDMA (digital) Locate Receiver
DCC	Digital Control Channel

The fourth character is an asterisk (*) when the TRU-II is transmitting or blank when it is not transmitting.

The last four characters show the current channel number or, if the TRU-II is idle, the last-tuned channel number. If the TRU-II has not been tuned to any channel, the last four characters are “IDLE”.

Table 11 lists TRU-II LED displays that occur when a TRU-II is not in the InService state.

Table 11
TRU-II LED displays when not in service

LED display	Meaning
“ROM IDLE”	The TRU-II is powered but is not in a Return-to-Service (RTS) state. The TRU-II awaits commands from the Meridian 1 to return it to service.
“RDRUxxxx”	The display indicates the name of the ROM firmware. The xxxx is the version number (for example, RDRUAC01). The TRU-II displays its ROM firmware name when it performs an on-board flash memory check. This check can take about 30 seconds, and the TRU-II can perform it every minute. During a memory check, the TRU-II holds messages that it receives from the Meridian 1 until after the memory check is complete.
“ MTCE “	The TRU-II is in maintenance mode, and communications are not set up yet. At the beginning of a normal RTS sequence, the TRU-II displays this message for only a fraction of a second.
“MTC IDLE”	The TRU-II is in maintenance mode, and communications have been set up. At the beginning of a normal RTS sequence, the TRU-II displays this message for only a fraction of a second.
“LAPDINIT”	The TRU-II is in the process of setting up communications. At the beginning of a normal RTS sequence, the TRU-II displays this message for only a fraction of a second.
“FS DEBUG”	The TRU-II is in the full-screen debug mode.

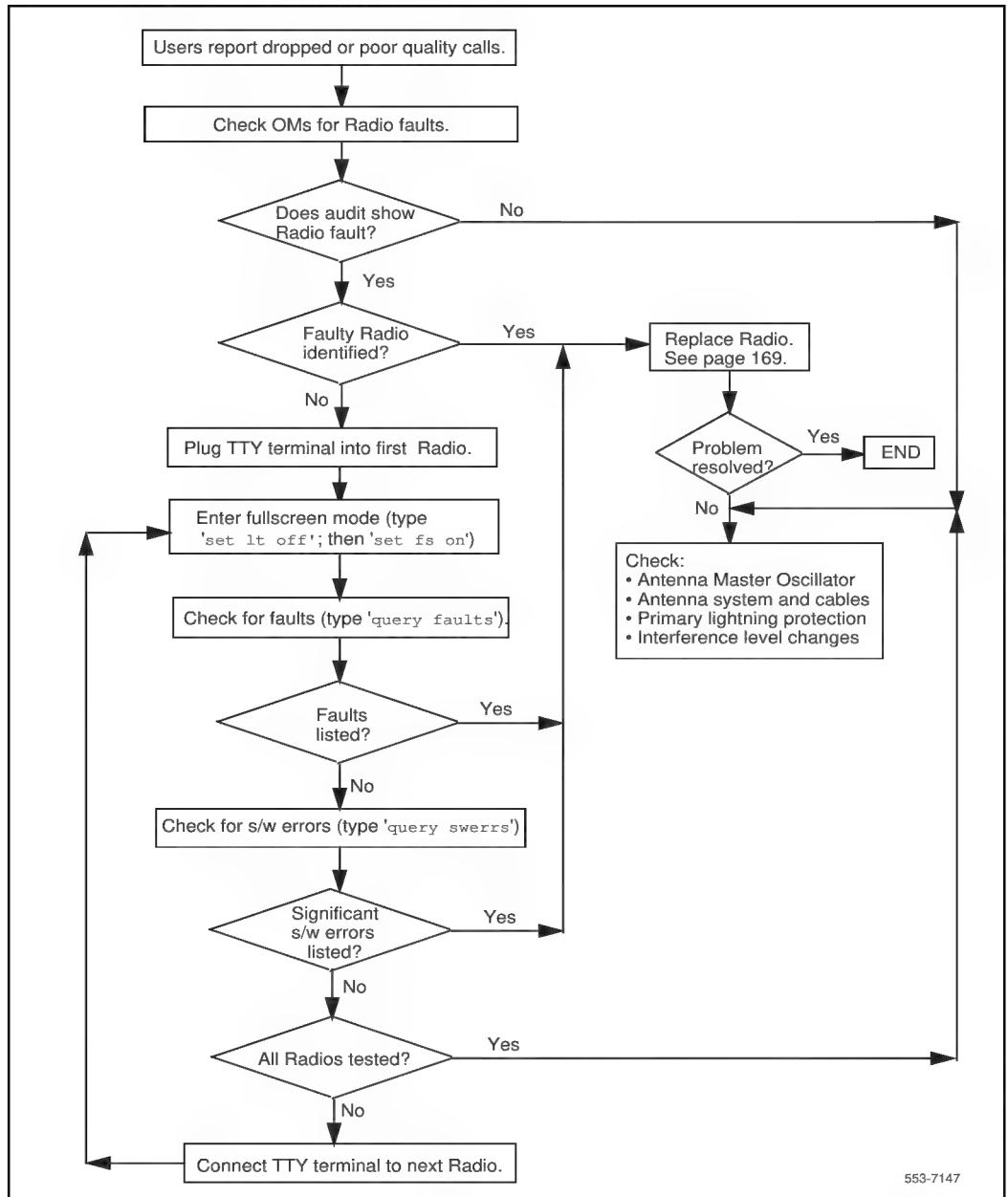
Table 12 lists TRU-II LED displays that occur during TRU-II programming.

Table 12
TRU-II LED displays during programming

LED display	Meaning
"FLS ERAS"	The existing load in TRU-II flash memory is being erased.
"LDG PGxx"	The TRU-II is being programmed. The TRU-II has 64 pages of flash memory, and the xx changes from 0 to 63 as each page is programmed.

Use Figure 36 to troubleshoot RF problems. These might be indicated by users reporting poor-quality or dropped calls, or by OMs indicating many dropped calls in a cell.

Figure 36
Troubleshooting flowchart—RF problems



APS testing

The Alarm and Power Supply (APS) module (NTLA40AA), shown in Figure 37 on page 96, combines two functional components in one package:

- The power supply, which uses a 115V AC/230V AC 50/60 Hz source to generate the DC voltage required by the MBS modules, supplies +28V DC, +15V DC, and +12V DC (for the fan).
- The local alarm card, which reports three Major and five Critical alarms from the Microcellular Base Station. Two alarm inputs (one Major and one Critical) are user-definable; the others are predefined. Local alarm indication is provided via eight LEDs on the unit’s front panel. First-line troubleshooting, after receipt of an MBS alarm at the MSM MAT, usually involves examining the status of these LEDs.

Refer to Table 13 on page 94 for a list of LED labels and the indication of each.

Table 13
 Base Station LEDs and their indications (Part 1 of 2)

LED	Indication
Osc Warm-up	Indicates a Major alarm; active when the Oven Controlled CSMO is initially warming-up after a power outage or during initial installation. This disables the CSMO output since frequency accuracy cannot be assured until the oven chamber has reached operating temperature. Normally, the alarm is automatically cleared once the warm-up period (less than 20 minutes) has elapsed. If the alarm remains on, replace the unit.
Major I/P	Indicates the generation of the user-definable Major alarm input.
OSC Fault	Indicates a Critical alarm; if ON it indicates the Compact Simplex Master Oscillator (CSMO) has failed for one of two reasons: — The signal amplitude has dropped below acceptable levels. — The current to the oven filament is out of limits. The unit should be replaced.
Fan Fail	Indicates a Major alarm; if ON it means the fan assembly has failed. A high-temperature failure will probably occur as well.

Table 13
Base Station LEDs and their indications (Part 2 of 2)

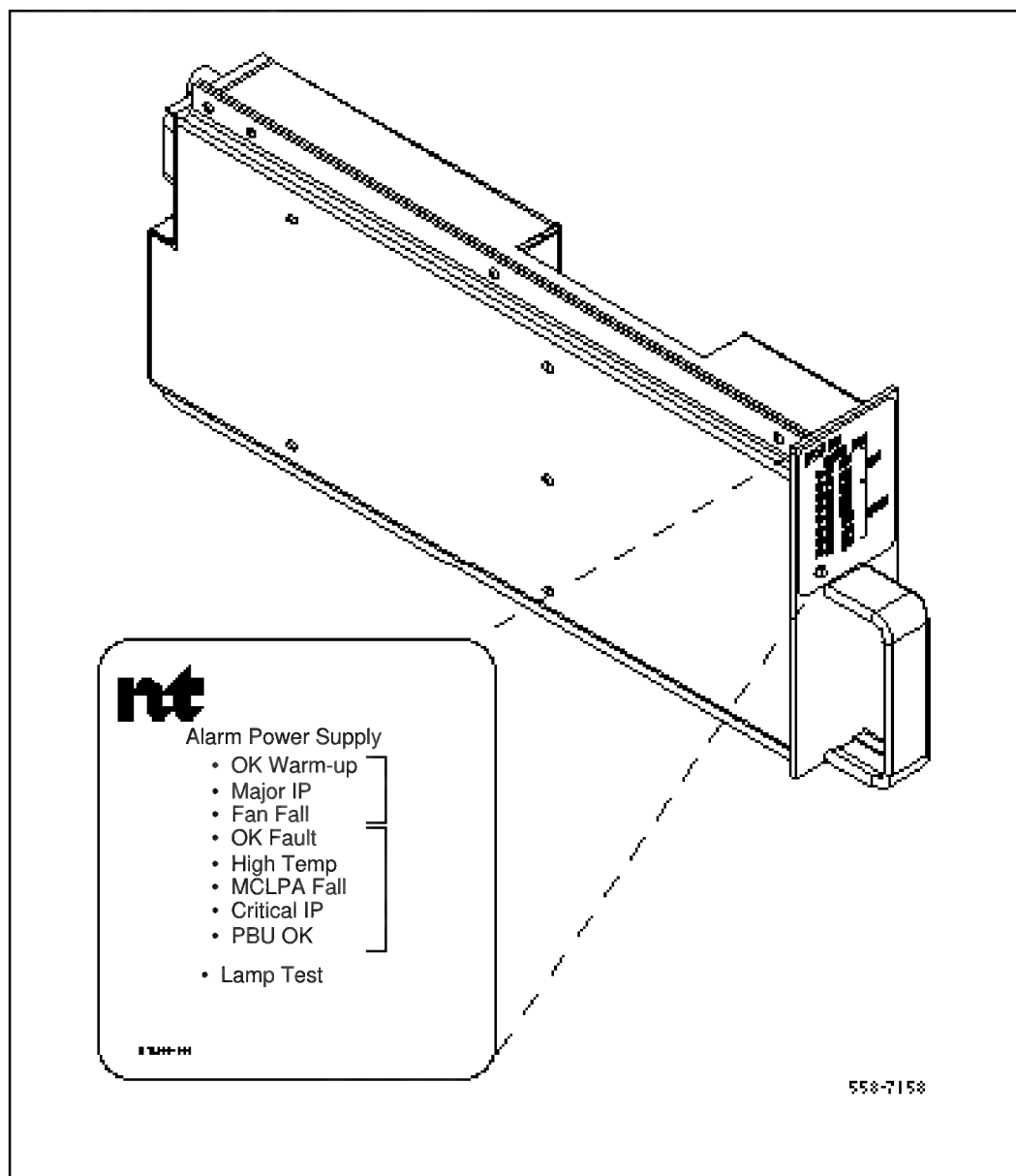
High Temp	Indicates a Critical alarm; if ON it means the maximum operating temperature, as measured by a sensor located within the APS package, has been exceeded. If no action is taken, the result would be excess stress on the MBS components which in turn may affect their mean time between failure and result in damage to them. Because of this, the 28V DC supply is disabled, which disables the TRU-Is, when this alarm is generated. If the temperature drops below the threshold, 28V DC is re-enabled automatically. A High Temp condition may be the result of failure of the fan assembly.
MCLPA Fail	Not used at present.
Critical I/P	Indicates the generation of the user-definable Critical alarm input.
PSU OK (green)	Indicates that the APS module is powered-up, and both +28V DC and +15V DC are being output within acceptable limits. It is possible that the MBS will continue to operate properly when this alarm is on (when the PSU OK LED is off). The alarm does not necessarily imply that there is no power to the MBS, or that it is not functioning. Any of the following can generate an alarm: — Either of the 15V DC or 28V DC_A PSU output voltages is outside approximately $\pm 10\%$ of its nominal values. This could be caused by a blown 28V DC_A fuse, in which case the MBS could still continue to function normally from the 28V DC_B line (TRU-Is 3 and 4). — 28V DC_B is below its nominal value by more than about 10%. This could be caused by a blown 28V DC_B fuse in which case the MBS could still continue to function normally from the 28V DC_A line (TRU-Is 1 and 2). — The internal PSU high voltage supply rail is not within its proper operating voltage range. This could be caused by loss of the AC input for more than about 20ms.

APS alarm unit testing

Perform the following actions to test the APS alarm unit:

- 1** Remove the MBS front plastic cover.
- 2** Verify that all LEDs on the unit's front panel are working by depressing the Lamp Test button.
- 3** Restore the alarm point to its normal state.

Figure 37
Alarm and Power Supply Module (APS)



- 4 Replace the MBS front cover.

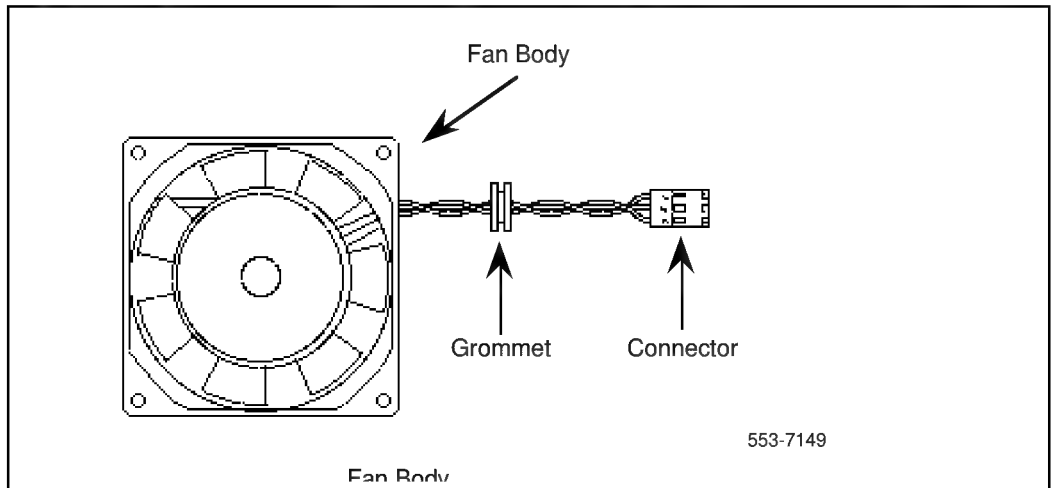
APS power supply testing

There is no ready access to voltages supplied by the APS. Proper operation of the power supply portion of the module can be verified, however, by observing the PSU OK LED on the unit's front panel. When on, it indicates that +28V DC and +15V DC are being output within acceptable limits.

Fan assembly

The fan assembly ventilates the MBS, reducing the possibility that heat-sensitive components in the MBS will be subjected to temperatures that might cause them to fail. Air flow is through the bottom of the MBS and out the back through the fan. Figure 38 shows the fan assembly. The fan assembly is a field replaceable unit.

Figure 38
Fan assembly



AC/DC Power Converter (NTAX73AA)

The AC/DC Power Converter converts 115/230 V AC mains into +24V DC. The resulting DC voltage is sent to the DC Power Converter for further processing.

DC Power Converter (NT2X70CA)

The DC Power Converter converts the +24V DC from the AC Power Converter into $\pm 5V$ DC and $\pm 12V$ DC for the circuit packs. It also provides power on/off, reset, and hold manual controls.

Proper power supply DC output is verified via test points located on the front panel. Note that the front panel LED never illuminates.

Antenna Matrix/Compact Simplex Master Oscillator (AMO) problems

The AMO (NTLA30AA) module combines two functional components in one package. See Figure 39.

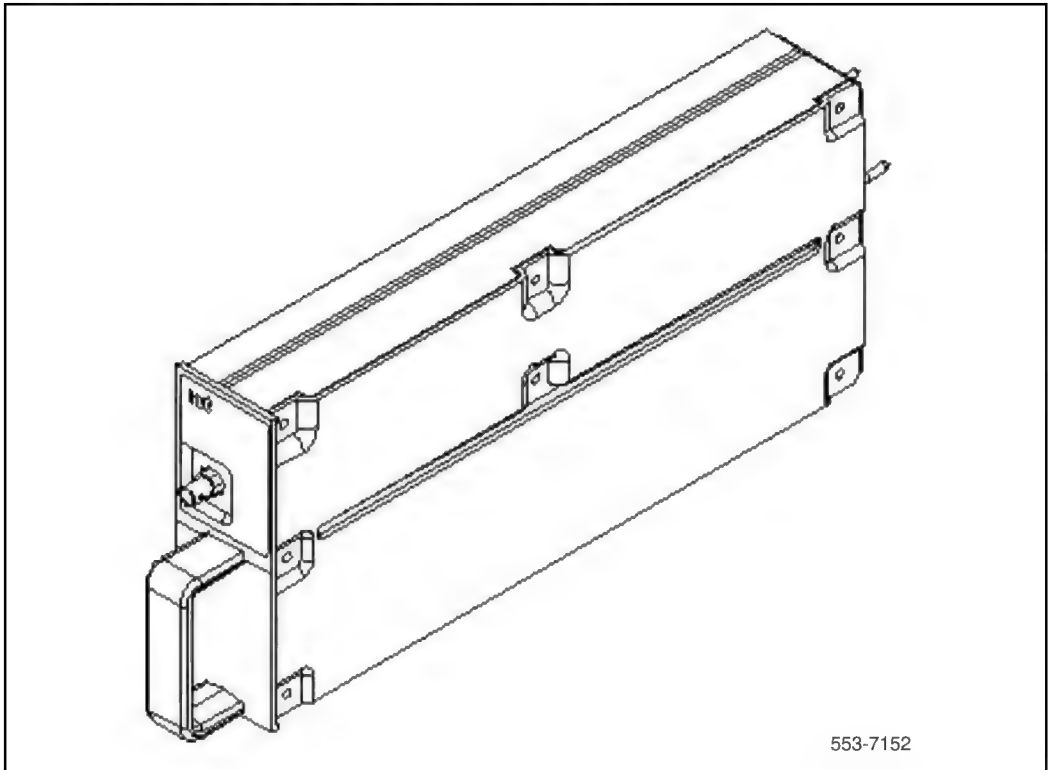
The Antenna Matrix in the AMO provides a 4x4 radio frequency combining function supporting the distributed antenna system. It provides the transmit combiner / duplexer function and the duplexer / receive multicoupler function for interface between up to four TRU-IIs and the distributed antenna system with external hybrids. All TRU-IIs in a cell have access to all (up to 16) antennas. The antenna matrix is passive and provides no alarm outputs.

The Compact Simplex Master Oscillator (CSMO) provides the high-stability 4.8 MHz signal used by the TRU-IIs to generate their RF signals. The signal from the CSMO can be monitored from a port on the front of the unit to verify its frequency accuracy.

The CSMO can generate three alarm indications:

- **Current Monitor Alarm (critical):** indicates the current flow to the oven filament is out of limits.
- **Oven Controller Crystal Oscillator (OCXO) Level Alarm (critical):** indicates unacceptably low amplitude of OCXO signal
- **Warm-up indicator alarm (major):** is generated during warm-up phase; oscillator output is disabled.

Figure 39
Antenna Matrix/Compact Simplex Master Oscillator



The Current Monitor Alarm senses conditions that are not expected once the OCXO has completed the warm-up cycle. If the current is below (open filament) or above (failed control circuit) specific thresholds, an alarm condition is generated. The current monitor alarm also provides an input voltage failure detector, since an absence of input voltage to the CSMO would also generate this alarm. This alarm will be active during the OCXO warm-up period, so the warm-up indicator alarm will also be active during normal power-up.

The Current Monitor Alarm will also be activated if the CSMO power/alarms are not connected in the MBS. The output level alarm is activated if the amplitude of the output signal from the splitter is below threshold. Both of these alarms are Critical; the warm-up indicator is classified as Major.

Portable problems

The following problems can cause a portable to be nonoperational:

- Portable not located
- Microcellular card failure
- Configuration problems
- CMCP heartbeat failure
- Meridian 1 INIT operation
- Noncompliance of portable
- Signal degradation
- Macrocell configuration problem
- Low on battery power
- Incorrect configuration
- Wrong mobile identification number (MIN) or electronic serial number (ESN)
- Wrong PSID or location ID
- Incorrect setting of RESEL_OFFSET for neighbor cells
- Portable not receiving calls
- For Multi-Site Networking, no available TLDN
- For Multi-Site Networking, D-Channel failure
- For Multi-Site Networking, Mobile User Directory (MUD) goes down

Portable not located

Portables that have moved out of range are not able to gain service. Also, a portable cannot be located in the following exception cases:

- An EIMC, MXC, or TRU-II is experiencing problems.
- The portable is turned off.
- The portable is momentarily in a radio blind spot. The expectation is that the user is moving and, therefore, will move out of the blind spot. If the user is not moving, the portable might remain in the blind spot.
- The cell in which the portable is located is unable to accommodate any more new calls. In this case, the user hears three short beeps.

In the event that a portable cannot be located, Call Forward No Answer treatment might be given, depending on configuration.

Microcellular card failure

Any failure of the EIMC or MISP causes all portables within the zone to be nonoperational. In the event of an EIMC or MISP failure, the Microcellular system might drop an existing call within the zone if a handoff is required.

Any failure of the MXC causes all TRU-IIs that the card supports to be nonoperational.

Configuration problems

An MISP installed in the wrong slot makes all portables nonoperational. (MISP applies only to Option 51C, 61C, 81, and 81C systems.)

Misconfiguration of connections to antennas or of the antenna structure might affect portables that TRU-IIs attached to those antennas service. Such misconfiguration might also make these portables unavailable.

CMCP heartbeat failure

In the event of three consecutive heartbeat failures, the CMCP automatically shuts down and locks the Microcellular system. The system drops all active calls involving portables and ceases service until the CMCP recovers the heartbeat.

Meridian 1 INIT operation

During an INIT operation on the Meridian 1 Core software, all calls that have not yet been transferred to a portable and certain established calls (per current operation) are dropped.

In the event of an INIT operation on the Meridian 1, the CTS may not be able to buffer all handoff requests until the Meridian 1 is operational again. Some handoff requests might be lost, resulting in calls being dropped.

Noncompliance of portable

If a user attempts to register or make an outgoing call from a portable that is either not complying to Microcellular parameters or not subscribed, the access is blocked. The blockage also applies to 911 calls.

Signal degradation

If a portable's signal level degrades past the handoff threshold but the call cannot be handed off (due to a problem such as an out-of-resource condition or a hostile RF environment), the call is dropped.

Macrocell configuration problem

If the portable does not find a Microcellular digital control channel (DCCH) this can be due to one of the following problems:

- The DCCH pointer on the public system might be set incorrectly.
- The external neighbor list might be set wrong if PSP/PDF is used on the portable.

Incorrect configuration

Any of the following incorrect configurations might cause a portable problem:

- If a portable uses PSP/PDF and the DCCH or ACH in the vicinity is not configured on the external cell, the portable does not find a Microcellular DCCH.
- If RSS_ACC_MIN, SID, SDC, PSID, SS_SUFF, or RESEL_OFFSET is not configured correctly, the portable does not camp onto a Microcellular DCCH, even with adequate signal strength.

- If RSS_ACC_MIN or MS_ACC_PWR is set incorrectly, the footprint of the microcell is either too small or too large.
- If the neighbor lists and camping parameters are set incorrectly, the portable keeps scanning before each reselection and does not go immediately to another channel.

Low battery power

When “low battery” is indicated on a portable, the battery must be recharged. Operation of the portable can degrade due to insufficient power.

Incorrect setting of reselection offset

If the RESEL_OFFSET value for an internal or external cell is set wrong in the Neighbor Cell properties, the portable ping-pongs between two cells.

Portable not receiving calls

If the portable can make outgoing calls but cannot receive incoming calls, the CLS for the portable should be configured with CFXA and CNDA. CPND must be configured for the portable.

D-Channel failure (Multi-Site Networking)

If a D-Channel failure occurs, a visiting portable can camp onto a macrocell channel. When the D-Channel comes up, the portable automatically registers with the visited Microcellular system through periodic registration or location registration.

Mobile User Directory (MUD) down (Multi-Site Networking)

If the MUD goes down, a visiting portable can camp onto a macrocell channel. When the MUD comes up, the portable automatically registers with the visited Microcellular system through periodic registration or location registration.

Field Replaceable Units and spare parts

This subsection provides details for replacing a faulty Field Replaceable Unit (FRU). Table 14 lists the Field Replaceable Units and spare parts available through Nortel.

Table 14
Field Replaceable Units and spare parts

Nortel part number	Description
SY2003	Microcellular Planning and Deployment Tools
SY2004	Mobility Microcellular Spares Package (contains 1 EIMC, 1 MXC, and 1 TRU-II)
NT6D73AA	MISP Card
NT7R01CA	Embedded Intelligent Mobility Controller Card (EIMC)
NTEX80AB	Microcellular Transcoder Card (MXC)
NTAX98AA	TRU-II (radio) (Field Replaceable Component, part of MBS Assembly)
NTLA00AA	MBS without TRU-II
NTLA30AA	Antenna Matrix/Oscillator (AMO) (Field Replaceable Component, part of MBS Assembly)
NTLA40AA	Alarm/Power Supply Module (APS) (Field Replaceable Component, part of MBS Assembly)
P0725473	MBS Fan (Field Replaceable Component, part of MBS Assembly)
NTLA50AA	MBS Wall Mount hardware
NTLA51AA	MBS Seismic Floor Mount hardware
NTLA52AA	MBS Rack Mount hardware
NTLA53AA	MBS Standard Floor Mount hardware
NTLA0001	RF antenna cable
NTLA0020	MBS interface cable
NTLA0010	AC cord
NTLA0002	MBS TNC terminator
A0609689	Hybrid terminator, 50-ohm "N" male

Nortel part number	Description
A0615483	Connector, "N" male 1/2"
A0600384	Connector, junction "N<-->N" female 1/2"
A0617457	Hybrid, Quad 4-Port
A0617460	Hybrid, Dual 8-Port
A0609534	Indoor antenna, directional
A0659298	Indoor antenna, omnidirectional
NT7R0901	Automatic Frequency Planning Station (AFPS)
NTE018AA	Remote Power Interconnect Unit 8 (RPI8)
NTE019AA	Remote Power Interconnect Unit 16 (RPI16)
NT2K65XJ	Meridian Communications Unit (MCU)
QCAD5B	RS-232 modem pool cable
A0633651	Option 11C 40Mb PCMCIA
A0659257	Option 11C 16Mb memory
P0879504	Mobility Microcellular NTP
P0841607	Mobility Microcellular Feature Card (20 each)

Removing power from an MBS

Nortel recommends the employment of supplemental ground at the MBS. You can determine whether or not the ground is for a specific MBS by removing the MBS rear access panel and looking at the supplemental grounding point. If no copper wires are clamped at the grounding point, supplemental ground is not being employed. For an MBS without supplemental ground, you must take special care when you remove power from the MBS (for service reasons), to ensure that there is no danger of electric shock. This section includes instructions for dealing with a nongrounded MBS.

Replacing a TRU-II (NTAX98AA)

Confirm the location of the faulty TRU-II and then perform the following procedure:

- 1 Remove the MBS front cover.
- 2 If the TRU-II to be replaced is configured as a voice channel, make sure it is not involved in a call. A busy TRU-II is indicated by the TRU-II's LED display: the characters "TTC," the channel number used, and an asterisk. An unselected TRU-II displays "IDLE".
- 3 At the MSM MAT, post the TRU-II to be replaced and place it in Locked state.
- 4 Loosen and rotate the TRU-II's latch so it no longer prevents its removal.
- 5 Pull the TRU-II from the shelf.
- 6 Install the replacement TRU-II.
- 7 Reposition the latch and secure it so it blocks removal of the TRU-II.
- 8 Replace the MBS front cover.
- 9 In the MSM Radio Object Manager window, if required, initiate the download of appropriate software to the TRU-II.
- 10 At the Radio Object Manager, unlock the appropriate TRU-II.

Replacing an AMO/MAM module (NTLA30AA)

Make sure the MBS containing the faulty AMO unit has been posted and placed out of service at the MSM MAT. Then perform the following procedure:

- 1** Remove the MBS front cover.
- 2** Loosen and rotate the AMO module retainer so it no longer prevents removal of the AMO.
- 3** Pull the AMO out of the shelf.
- 4** Install the replacement AMO module.
- 5** Reposition and secure the retainer so it blocks the removal of the AMO.
- 6** The Master Oscillator portion of the AMO/MAM requires a warm-up interval before the output signal is enabled. This warm-up period is indicated by the 'Osc Warm-up' LED on the APS module (typically less than 20 minutes).
- 7** When the warm-up indicator turns off, return the TRUs in the affected MBS to service.
- 8** Replace the MBS front cover.

Replacing the Alarm and Power Supply Unit (APS) (NTLA40AA)

Make sure the MBS containing the faulty APS unit has been posted and placed out of service at the MSM MAT. Then perform the following procedure:

- 1** Remove the MBS rear cover.
- 2** If supplemental ground is not properly connected, then:
 - disconnect all antennas
 - disconnect all interface cables
- 3** Remove power to the MBS by disconnecting its power cord.
- 4** Remove the MBS front cover.
- 5** Loosen and rotate the APS retainer latch so it no longer prevents removal of the APS.
- 6** Pull the APS from the shelf.
- 7** Note the configurations of the four miniature slide switches and four DIP switches through the access hole on the bottom of the removed module. Make sure that the switches on the replacement unit match those on the faulty APS.
- 8** Install the replacement APS.
- 9** Reposition and secure the latch so it blocks removal of the APS.
- 10** Replace the MBS front cover.
- 11** Reconnect all antennas and interface cables (if disconnected).
- 12** Replace the MBS rear cover.
- 13** Restore power to the MBS and for each TRU-II in the MBS, perform an Unlock operation.

Replacing a fan assembly

Make sure the MBS containing the faulty fan assembly has been posted and placed out of service at the MSM MAT. Then perform the following procedure

- 1** Remove the MBS rear plastic cover.
- 2** Remove power to the MBS by disconnecting its power cord.
- 3** If supplemental ground is not properly connected, then
 - disconnect all antennas
 - disconnect all interface cables
- 4** Remove the two screws at the top of the bulkhead and pivot the bulkhead to the downward position.
- 5** Disconnect the fan connector (located near the top of the backplane).
- 6** Remove the four long screws that hold the fan in place, and remove the fan.
- 7** Position the new fan and replace the four long screws, securing the fan to the chassis.
- 8** Ensure that the grommet on the fan power leads sits properly in the cable slot.
- 9** Connect the fan connector.
- 10** Pivot the bulkhead back into place; replace the two screws and secure the bulkhead.
- 11** Reconnect all antennas and interface cables (if disconnected).
- 12** Replace the rear plastic cover.
- 13** Restore power to the MBS and for each TRU-II in the MBS, perform an Unlock operation.

Feature operations

This section presents the following information:

- A list of the Meridian 1 features available to users
- An explanation of basic call operations
- A description of procedures for invoking and canceling features from a Microcellular portable.

System capabilities

The Microcellular system provides the following basic capabilities:

- Registration/deregistration
- Basic call setup
 - Outgoing call
 - Incoming call
- Handoffs
- Meridian 1 feature access

For information about configuring and registering portable telephones, see the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

For information about the Multi-Site Networking option, see the *Nortel COMPANION Microcellular Multi-Site Networking Description, operations, and administration* (553-3611-110).

For other information about system capabilities, see “List of terms” on page 151 or the *Nortel COMPANION Microcellular Installation guide* (553-3611-200).

Meridian 1 features in a Microcellular system

The following Meridian 1 features are available to Microcellular users while in-building. Appendix A, “Microcellular feature descriptions” on page 125, provides information on using, activating, and canceling these features.

- Access Restrictions
- Access to Paging
- Access to Recorded Telephone Dictation
- Attendant Features
 - Attendant End-to-End Signaling
 - Automatic Timed Reminders
 - Busy Lamp Field
 - Splitting
- Call Detail Recording (CDR) / CDR on Redirected Calls
- Call Forward All Calls
- Call Forward Busy
- Call Forward External
- Call Forward No Answer
- Calling Line Identification (CLID)
- Calling Party Name Display (CPND) (see *Note*)
- Call Park / Call Park Networkwide
- Call Redirection Service (see *Note*)
- Call Redirection by Time Of Day
- Call Transfer (see *Note*)
- Call Waiting
- Call Waiting Redirection
- Conference (3-party) (see *Note*)
- Direct Inward System Access (DISA)

- Directory Number Expansion
- Direct Private Network Access
- Electronic Switched Network (ESN)
 - End-to-End Signaling
 - ESN Uniform Dialing Plan
 - Network Alternate Route Selection (NARS)
 - Network Call Transfer (see *Note*)
 - Network Class of Service
 - Network Control Signaling
- Hunting (see *Note*)
- Intercept (see *Note*)
- ISDN Primary Rate Interface
 - Basic Call, North America ISDN PRA Connectivity
 - Call Redirection Service (see *Note*)
 - CLID
 - Network Call Party Name Display (see *Note*)
- Messaging Centers
 - IVMS/IMS
 - Meridian Mail
 - Message Waiting Center (see *Note*)
- Message Waiting Indication
- Multiple Appearance Directory Number (MADN) (see *Note*)
- Multi-Customer

- Music / Enhanced Music
 - Network Message Services
 - Meridian Mail
 - Message Centers (see *Note*)
 - Night Service / Trunk Answer from Any Station (TAFAS) (see *Note*)
 - Trunk Route Optimization Before Answer
- One Number Call Delivery (see *Note*)
- Pretranslation
- Recorded Announcement
- Recorded Announcement for Calls Diverted to External Trunks
- Secretarial Filtering
- Speed Call / System Speed Call (see *Note*)
- Timed Forced Disconnect
- Trunk Anti-Tromboning
- User Selectable Call Redirection (see *Note*)
- Wireless Privacy

Note: This feature operates differently in conjunction with a portable set than with wired sets. In some cases, certain limitations apply to use with a portable. For a detailed explanation of the operations of all Microcellular features, see Appendix A, “Microcellular feature descriptions” on page 125. For information about feature operations and support for the Multi-Site Networking option, see the *Nortel COMPANION Microcellular Multi-Site Networking Description, operations, and administration* (553-3611-110).

Basic call operations

The following actions are defined as follows for use in subsequent paragraphs:

- **Answer call:** Press the SEND key or flip the mouthpiece open to connect to an incoming call.
- **Disconnect call:** Press the END key or flip the mouthpiece closed to end a call.
- **Switchhook:** Signal a flash request by pressing the SEND key.
- **Idle:** The portable is registered and powered on but not active.

Table 15 illustrates normal operations of call setup, teardown, and handoff.

Table 15
Operational sequence for normal calls

Call type	User action	Result
Call setup (outgoing)	1. While set is idle, dial digits and press the SEND key.	The portable receives ringback tone as the system attempts to terminate.
	2. The terminating end answers the call.	The call is established.
Call setup (incoming)	1. Caller dials the DN of the portable.	Ringback is given to the originator. Radio paging of the portable takes place. Once located, the call is delivered, and the portable rings itself.
	2. The portable user answers the call.	Ringback stops. The caller and the portable terminal are connected.
Call teardown	Either end user disconnects the call.	The call is disconnected on both ends.
Call handoff	The portable moves from one cell to another within the same system.	The portable user might hear one or two “clicks” while receiving call service during the handoff.

Feature operations via dial access

Dial access enables a portable user to access features on the Meridian 1 system by entering special digits that activate or cancel features. The Meridian 1 system manages the transition to the requested feature.

The special digits that the user must enter are the Mobility Special Prefix code plus a Mobility Feature Code (MSPRE+MFCO), defined as follows:

- MSPRE:** customer-defined, using one to four digits or asterisk (*) characters. Customers can use MSPRE instead of SPRE codes for dial access to features from portables. MSPRE uses the digits 0-9, plus the asterisk, to activate features. The default value of MSPRE is *, adapted from cellular dialing plans.
- MFCO:** a dialing sequence to invoke a specific feature. An MFCO can have the same value as another number already in the dialing plan (for example, the same values as the fixed feature-access code that users dial after a SPRE code on a wireline terminal to access a given feature). However, MFCO sequences may not conflict with cellular feature codes.

Table 16 displays dial-access features that require an MFCO and the corresponding MFCO default for each feature.

Table 16
Special features and their MFCO default codes

Feature	MFCO
To enable/disable CWF (Call Forward All Calls)	71/710
To Park/Retrieve a call	77/770
System Speed Call User	78

Note: Transfer, Three Party Conference, and Call Waiting features do not require MSPRE or MFCO codes.

If the system cannot identify your feature as a string, the call proceeds as if a DN were dialed; most likely, you would receive an invalid DN treatment.

Tones provided on portables

The Meridian 1 system always provides in-band tones (for example, audible ringback, reorder tones, and call waiting). However, portables are still responsible for providing ringing locally.

Dial-access features

The following sections describe the operations of each dial-access feature. The displays in these sections might differ from the displays on your portable.

Call Forward All Calls

To forward all calls, use the procedure in Table 17.

Table 17
Activating Call Forward All Calls

Step	User action	Result
1	While the portable is idle, dial MSPRE+71+DN and press SEND.	The Meridian 1 system validates the forwarding DN. If the DN is valid, the system activates Call Forward All Calls for the portable. Go to step 2. If the DN is invalid, the system sends the Overflow tone and does not activate Call Forward All Calls. Go to step 3.
2	Dial the number to which you want to forward all calls and press SEND.	The system validates the forwarding DN. If the DN is valid, the system activates Call Forward All Calls is activated. If the DN is invalid, the system sends the Overflow tone and does not activate Call Forward All Calls.
3	Disconnect the call (optional).	The portable becomes idle whether or not the user manually disconnects the call.

To verify that Call Forward has been entered correctly, use the procedure in Table 18.

Table 18
Verifying Call Forward

Step	User action	Result
1	While the portable is idle, dial the portable DN and press SEND.	The call is forwarded to the CFW DN.

To cancel Call Forward All Calls, use the procedure in Table 19.

Table 19
Canceling Call Forward All Calls

Step	User action	Result
1	While portable is idle, dial MSPRE+710.	Display: S710 S is the MSPRE and 710 is the feature code as dialed.
2	Press SEND.	Call Forward All Calls is deactivated.
3	Disconnect the call (optional).	The portable becomes idle whether or not the user manually disconnects the call.

To park a call, use the procedure in Table 20.

Table 20
Parking a call

Step	User action	Result
1	While on an active call, press SEND.	The call is put on hold.
2	While on an active call, dial MSPRE+77+extension number to park the call, and press SEND.	Display: S77XXXX S is the MSPRE, 77 is the feature code, and XXXX is the parked DN as dialed. The system validates the parked DN. If the DN is valid, the user does not hear any tone. If the extension number is invalid, the user hears the Overflow tone (see Notes 1 and 2).
3	Disconnect the call.	The call is parked and the portable becomes idle.

Note 1: While hearing Overflow tone, press SEND to cancel Call Park and to reconnect with the first party. If you still want to park the call, repeat the operations, starting from step 1.

Note 2: While hearing Overflow tone, press END to cancel Call Park and to disconnect the call with the first party.

To retrieve a parked call, use the procedure in Table 21:

Table 21
Retrieving a parked call

Step	User action	Result
1	While the portable is idle, dial MSPRE+770.	Display: S770 S is the MSPRE and 770 is the feature code as dialed.
2	Dial the extension at which the call is parked.	Display: S770XXXX S is the MSPRE, 770 is the feature code, and XXXX is the parked DN as dialed.
3	Press the SEND key.	If the DN is valid, a connection to the parked call is made. Display: S770XXXX S is the MSPRE, 770 is the feature code, and XXXX is the parked DN as dialed. If the DN is invalid, the system sends the Overflow tone (Note 1).

Note 1: While hearing the Overflow tone, press END and try again.

Note 2: The actual display depends on switch configuration and portable characteristics.

To answer a Call Park recall, use the procedure in Table 22:

Table 22
Answering a Call Park recall

Step	User action	Result
1	A parked call is not retrieved before the Call Park Timer expires.	The Call Park recall is presented to the portable. The portable provides ringing locally.
2	The user answers the recall.	The call is connected.

Call Waiting

To answer a Call Waiting call, use the procedure in Table 23:

Table 23
Answering a Call Waiting call

Step	User action	Result
1	If you hear a beep while on an active call, press SEND.	The system puts the current (first) call on Hold, and you can answer the waiting (second) call.
2	Press SEND.	The system puts the second call on Hold, and you can resume the first call.

Note 1: The user can toggle between the two calls by repeating step 2. The user cannot perform a transfer or a conference until at least one call has been released. After the Call Waiting display appears, pressing END or closing the mouthpiece disconnects both calls.

Note 2: A Call Waiting indication is not presented to a portable in either transfer or conference mode.

Three-Party Conference

To add a new party to an established call, use the procedure in Table 24:

Table 24
Adding a new party to a call

Step	User action	Result
1	While on an active call, press SEND.	The call is put on hold.
2	Dial the telephone number of the person to be included in the call; then press SEND.	Display: XXXX XXXX is the DN as dialed. If the DN is valid, the system sends the ringback tone. Otherwise, it sends the Overflow tone (see Note 1).
3	When the call is answered, press SEND again.	All parties are included in the call.
4	If the telephone number of the second person is busy or the person does not answer, press SEND.	Reconnect with the first party.

Note 1: While hearing Overflow tone, press SEND to disconnect the second call and to reconnect with the first party. If you still want conference mode, repeat the operations, starting from step 1.

Note 2: The actual display depends on switch configuration and portable characteristics.

System Speed Call

To make a System Speed Call using ENBLOC dialing, use the procedure in Table 25:

Table 25
Making a System Speed Call

Step	User action	Result
1	While portable is idle, dial MSPRE+78.	Display: S78 S is the MSPRE and 78 is the feature code as dialed.
2	Dial the Speed Call code.	Display: S78Z S is the MSPRE, 78 is the feature code, and Z is the code as dialed.
3	Press SEND key.	The telephone number stored against the Speed Call code is dialed automatically as if it were dialed directly from the portable.

Note 1: A portable cannot be configured as a Controller of System Speed Call.

Note 2: The actual display depends on switch configuration and portable characteristics.

Transfer

To transfer an active call, use the procedure in Table 26:

Table 26
Call Transfer

Step	User action	Result
1	While on an active call, press SEND.	The call is put on hold.
2	Dial the number to which you want the call transferred and press SEND.	Display: XXXX XXXX is the DN as dialed. If the DN is valid, the system sends the ringback tone. Otherwise, it sends the Overflow tone (see Note 1).
3a	Disconnect the call when you receive the ringback tone or after you answer the call.	The transfer is completed.
3b	Press SEND before or while ringing tone is received.	The transfer is canceled and the held party is reconnected.

Note 1: While you hear the Overflow tone, pressing SEND would disconnect the second call and reconnect with the first party. If you still want the transfer, repeat the operations, starting from step 1.

Note 2: The actual display depends on switch configuration and portable characteristics.

Abnormal operations

For information about abnormal operations or failures, refer to the section “Portable problems” on page 100.

Appendix A: Microcellular feature descriptions

This appendix describes Meridian 1 and set features available to portable stations. Each section of this appendix describes a feature briefly and discusses the feature's availability on portables. The discussions include information about interactions between portables and wireline terminals and, where applicable, how portable feature use impacts wireline terminals.

The following notations appear in this appendix:

— (S)

The Microcellular system supports this feature for portables. Features that operate exactly the same on portables as on wireline terminals are “transparent” to portable users.

— (P)

The Microcellular system partially supports this feature for portables.

— (U)

Portable users cannot take advantage of this feature.

500/2500 Line Disconnect (S)

This feature applies to 500/2500 ports connected to an outboard processor such as an automated voice equipment. When a call is routed to such a port, the Meridian 1 supervises for disconnect. If the Meridian 1 detects an on-hook/disconnect from a party connected to a 500/2500 port (and the port has LDTA class of service), dialtone is sent to this port for a specified duration.

If a portable is connected to a 500/2500 port with LTDA class of service, the 500/2500 Line Disconnect feature applies dialtone to the port when the portable initiates call disconnect.

500/2500 Disconnect for Outgoing Calls (S)

The 500/2500 set disconnect feature operates for both incoming and outgoing calls. Dial tone is returned to an off-hook 500/2500 (LTDA) port for all call types, internal and external, over digital or analog facilities, when a positive indication of far end release is available to the Meridian 1.

If a portable is connected to a 500/2500 port with LTDA class of service, the 500/2500 Line Disconnect feature applies when the far end initiates call disconnect.

Access Restrictions (S)

Access restrictions are used to limit individual users' access to the exchange network, private network, services and features. These restrictions can control calls made or answered from certain telephones. The Meridian 1 system performs access checks based on:

- the Class of Service (COS) of the individual station
- the Trunk Group Access Restriction (TGAR) code of the station
- the area and exchange codes dialed by stations with Toll-Denied COS

If any restrictions are detected when a call is placed, the call is denied and intercept treatment is applied as defined in the Customer Data Block.

For portables, the three access checks are imposed, and the intercept treatment is given if a call is denied.

Access to Paging (S)

A station can gain access to the paging equipment by dialing the paging trunk access code. This capability is transparent to a portable user.

Access to Recorded Telephone Dictation (S)

The Access to Recorded Telephone Dictation feature provides dial access to customer-supplied dictation equipment. This capability is transparent to a portable user.

ACD Agent/Supervisor (U)

A portable *cannot* be either an ACD agent or a supervisor position.

Attendant features

Attendant features include Attendant End-to-End Signaling, Automatic Timed Reminder, Barge-In/Busy Verify, Busy Lamp Field, and Splitting.

Attendant End-to-End Signaling (S)

Attendant End-to-End Signaling (AEES) allows an attendant console in AEES mode to communicate with the source or destination party through in-band DTMF (Dual Tone Multiple Frequency) tones on an established speechpath. The application of AEES is for sets which cannot generate DTMF tones to get assistance from the attendant in accessing devices or services requiring DTMF communication.

AEES is supported to a portable. Also, a portable can dial the attendant and request access to services requiring End-to-End Signaling.

Automatic Timed Reminders (S)

Automatic Timed Reminders automatically alert the attendant when an attendant-extended call is not answered within a predefined period of time. Recall timers are available on a customer basis for Slow Answer, Camp-on and Call Waiting calls.

A portable-originated call extended by the attendant to a wired party is timed for recalls. When the timer expires, the call redirects back to the attendant.

A call extended by the attendant to a portable DN is also timed for recall. Upon expiration of the timer, the calling party recalls back to the attendant source.

Barge-In/Busy Verify (U)

Barge-In enables an attendant to break into an established call. Busy Verify enables an attendant to verify the status of a particular DN. Barge-In and Busy-Verify are not supported whenever a portable is involved as either the originating or the terminating party.

Busy Lamp Field (S)

Busy Lamp Field (BLF) displays the busy/idle status of 150 consecutive DNs on an add-on BLF module attached to the attendant console. The starting DN is defined in the customer data block. Enhanced BLF provides the capability for the attendant to dynamically display the status of a hundreds group (100 DNs) in which the dialled DN belongs. This helps to indicate to the attendant that the party to whom s/he is extending a call is busy.

If a DN is in a multiple call arrangement, the BLF indication will only be on if all appearances are busy.

BLF is supported on portables. However, if a portable is turned off, it is reflected as idle on an add-on BLF module. In other words, an attendant cannot distinguish whether a portable is truly idle or actually turned off or simply out of range of the Microcellular system.

Splitting (S)

Splitting allows the attendant to selectively talk to either the source or destination party by pressing the Exclude Source (EXCL SRC) or Exclude Destination (EXCL DEST) key. The excluded party is split from the attendant conference circuit. This feature is transparent when applied to a portable involved in an attendant call.

Call Detail Recording on redirected incoming calls (S)

This feature modifies the content of the terminator identification field of the CDR by adding either the answering party or the sending party in the redirecting chain for the following call scenarios:

- Call Forward All Calls
- Call Forward No Answer
- Call Forward Busy
- Hunt

This feature is transparent to portables.

Call Forward

The Call Forward feature includes Call Forward All Calls, Call Forward Busy, Call Forward External, Call Forward No Answer, and Second Level Forward No Answer.

Call Forward All Calls (S)

Call Forward All Calls (CFW) allows all incoming calls to a station to be automatically forwarded to a pre-selected destination, within or outside of the switch. This feature can be activated/deactivated through dial access. Call Forward All Calls is supported on a portable, however, the portable will not display the call modification.

Remote Call Forward is not supported on a portable because Flexible Feature Codes (FFC) are not supported. Nevertheless, a portable DN can be remotely programmed as the forward DN.

Call Forward Busy (S)

Call Forward Busy (CFB) allows a DID call encountering a busy DN to be forwarded to the attendant if the busy station is call Forward Busy Allowed (FBA). Call Forward Busy applies to the primary DN of a set.

CFB is supported on portables.

Call Forward External(S)

Call Forward External enables a user to forward a DN to an external number. Call Forward External is controlled by the Class of Service and can be allowed or denied on a per DN basis.

Call Forward External is supported for portables.

Call Forward No Answer (S) and Second Level Forward No Answer (P)

Call Forward No Answer (CFNA) and Second Level Forward No Answer (SFNA) automatically forward an unanswered call to another DN after a customer-specified number of rings. The classes of service Call Forward No answer Allowed (FNA) and Second Level Call Forward No Answer Allowed (SFA) activate the feature on a TN basis. Customer options can be defined for DID, non-DID and local calls to deny CFNA for all stations, to CFNA to the attendant, to CFNA to an assigned hunt DN or a flexible CFNA DN defined per TN.

Calls terminating to a portable not answered within a given time frame can be subjected to CFNA redirection. In addition, the CFNA treatment can also be given in the event that a portable cannot receive an incoming call due to Microcellular hardware failure, or the system is unable to locate the portable. A portable originated call terminating to a wired terminal can be subject to CFNA redirection. Furthermore, a portable DN can be defined as a CFNA DN.

Second Level Forward No Answer is not supported. However, a portable originated call terminating to a wired terminal can be subject to SFA redirection.

Call Hold/Exclusive Hold (U)

With Individual Hold Class of Service, when a user puts a call on hold, normal hold (winking) is indicated at the user's telephone only. A slow flicker is shown at all other telephones with the multiple appearance.

With Exclusive Hold Class of Service, multiple appearances of a line remain exclusive to the user's telephone, even when the call is put on hold. While hold (winking) is indicated at the telephone holding the call, the DN lamp is steadily lit on all other appearances of the held call. The Privacy Release key must be used for access by other appearances of the DN.

Call Hold and Exclusive Hold are not supported on portables.

Call Park (S)

Call Park allows an attendant or a station to park a call on a DN so that any user can connect to it from any attendant console or station. A call in Park does not occupy any DN but a System Park DN or any station DN may be used as an access identifier to retrieve the parked call. A call can be parked via a PARK key or by SPRE access, and retrieved by dialing the System Park DN, or, for a call parked against a station DN, a SPRE code access and the station DN. A parked call is placed into the park queue until retrieval time.

A portable can place and retrieve a call in Park. In addition, a portable DN can be used as a station park DN. Furthermore, a portable call can be placed in Park.

Call Park - Networkwide (S)

Call Park-Networkwide allows each customer to have up to 5 Call Park Blocks and each block has its own attributes. The maximum Call Park Recall Time in each block is 480 seconds and maximum number of System Park DNS is 100 seconds per block.

This feature provides the Parking Party an option to park a call onto a Station DN or a System Park DN located at any Meridian 1 Node that is within the same MCDN NAS Network as the Parking Party. The parked call can be retrieved by an outside caller via either ESN dialing from private network or DID dialing from external resource.

A portable can place and retrieve a call in Park, and a portable DN can be used as a station park DN. Furthermore, a portable call can be placed in Park.

Call Pick-Up/Call Pick-Up Directed (U)

Call Pick-Up allows groups of stations to be designated as or assigned to call pickup groups so that a user with Call Pick-Up Allowed (PUA) can answer any call made to any set within the call pickup group. A call can be picked-up using a CALL PICKUP key or via SPRE code access. Directed Call Pick-Up provides Group Pick-Up, which enables a user to answer a call from a specified group, and Directory Number Pick-Up, which enables a user to answer a call ringing on a specified DN.

A portable cannot pick up a call and cannot be assigned to a call pick-up group.

Call Redirection By Time of Day (S)

Call Redirection By Time of Day provides automatic redirection of the incoming call to a defined DN depending on the time of the day.

This capability applies to the following features:

- Call Forward and hunt by Call type(CFCT): with this feature enabled, the internal/external call is redirected to alternate internal/external DN during the specified time.
- Call Forward No Answer(CFNA): with this feature enabled, “no answer” calls will be given CFNA treatment according to the time of day.
- Second Level Call Forward No Answer(SFNA): with this feature enabled, CFNA treatment is also given for the incoming calls after the first level redirection.

This feature is customer-configurable and is supported by portables; however, no display updates will be given to portables.

Call Redirection Service (P)

Call Redirection Service provides the ability to redirect a call across the ISDN PRI network through Call Forward, Call Forward No Answer, Transfer, and other options. Call redirection indications are presented to the party receiving the call redirection and the party being redirected.

For portables, Call Redirection Service is supported as follows:

- Incoming calls to a portable can be redirected across PRA via Call Forward, Call Forward No Answer, and Call Transfer.
- A portable involved in a call can be redirected by a wired set across the ISDN PRI network.

Call redirection indications, however, are not provided on the portable, although they are presented to other parties where applicable.

Call Transfer (P)

Call Transfer allows a telephone user on any two-party call to hold the existing call and originate another call to a third party. The user may consult privately or transfer the original call to the third party.

Both blind and consultation Call Transfer are supported on portables. A portable involved in a call can be transferred; however, the portable's display is not updated for the call modification. Furthermore, a call can be transferred to a portable.

Call Waiting/Station-to-Station Call Waiting (S)

The Call Waiting feature notifies a user on an active call that an external call is waiting to be answered on the same line. SL-1 and Meridian digital telephones must have a Call Waiting key/lamp pair assigned and a class of service that allows a warning tone. When a Call Waiting call presents to a SL-1 or Meridian digital telephone, the Call Waiting lamp flashes and a buzz sounds through the telephone's speaker.

Call Waiting is supported on portables. However, there are no visual indications of a waiting call due to lack of support for key/lamp pairs on portables. Since portables cannot support Tone Buzing locally, in-band tone is provided as an alert. A portable user can toggle between the two calls by a switchhook flash. However, the user cannot transfer or conference either call until at least one call is disconnected.

Call Waiting Redirection (S)

The Call Waiting Redirection feature allows unanswered calls given Call Waiting treatment to receive call redirection via Call Forward No Answer (CFNA) for the active set. An unanswered call receiving Call Waiting treatment is redirected to the active set's CFNA DN after the expiration of the CFNA timer defined for that set. This redirected call is treated as an unanswered call by the CFNA DN (e.g. messaging services such as Meridian Mail, Voice Mail, and Message Centers).

This feature is supported to calls waiting on portables. In addition, a portable originated call can be subject to Call Waiting Redirection treatment.

Call-By-Call Service on NI-2 TR1268 (S)

This feature provides Call-By-Call service selection capabilities for the NI-2 TR-1268 PRI Interface that is implemented on the UIPE platform. It is an alternative to provide services on a dedicated route (B-channel) basis and allows multiple services to share the same common pool of B-channels.

This feature is transparent to portables.

Called Party Disconnect Control (P)

Called Party Disconnect Control permits a terminated incoming call to be re-established when the caller goes offhook, or traced to the originating source.

This feature is applied to portables in the following manner:

- For an incoming trunk call terminating on a portable, the CPDC feature is transparent; that is, the disconnect signal from the trunk is ignored.
- For a CPDC call originated from a portable and terminating to an outgoing trunk, the disconnect signal from either end is executed normally according to the existing operation. However, the radio connection between the portable and the trunk is released. Thus, the call is disconnected from the portable's perspective, but the trunk is still busy.

Calling Line ID (S)

Calling Line ID (CLID) provides for the delivery of the caller's number (if known by the Meridian 1 system) to the called set.

CLID is supported for portables.

Calling Party Name Display (P)

Calling Party Name Display (CPND) provides for the display of the calling party's name on the terminating set and the called party's name on the calling set. The portable DNs can have their names defined in the CPND database in Overlay 95. The CPND of the portable is displayed on the called set; however, display of the CPND of the caller is not displayed on the portable.

Centrex Switchhook Flash (U)

Centrex Switchhook Flash (THF) provides an interface between the Meridian 1 and Centrex type services. Stations are given the capability to generate a switchhook signal to a Centrex system and access Centrex features, when on an established Centrex call. To invoke THF from a PBX set, a station user depresses the switchhook flash to generate special dial tone, then dials the SPRE + THF feature code. To invoke THF from SL-1 or Digital sets, the user depresses the THF feature key.

Users cannot activate THF from portables.

Conference (3 and 6 party) (P)

A portable user can initiate a 3-party conference call. A portable can also be added by another party to join in a 3-party conference. Once a portable switches from any state to the conference state, the portable display is updated accordingly.

A portable user cannot initiate a 6-party conference call. A portable can be added, however, by another party to join in a 6-party conference.

Inter-EIMC handoff during a conference call is not supported. In addition, a portable user cannot toggle between the two calls when adding a party to a conference.

Direct Inward System Access (S)

Direct Inward System Access (DISA) allows selected users to access the Meridian 1 directly from the public network by dialing a special directory number assigned by the customer. The special directory number dialed by a DISA user is associated with a particular DISA-DN.

This feature is transparent to portables since it's a trunk feature.

Direct Private Network Access (S)

Direct Private Network Access (DPNA) is transparent to portables.

Directory Number Expansion (S)

DN Expansion increases internal DN capacity from four digits per DN to seven digits per DN. DN expansion applies to portable DNs.

Electronic Switched Network (ESN)

Northern Telecom's Electronic Switched Network (ESN) is a comprehensive networking package which ties separate corporate communications systems into one unified, private communications network. ESN offers various features and functions to accomplish efficient call handling.

Many of these ESN features and functions are available to portables, such as ESN Route Selection, ESN dialing plans and others. The following sections address the potential interactions between portables and ESN features.

End-to-End Signaling (S)

The End-to-End Signaling (EES) feature enables a station to send Digitone end-to-end signaling through an established outgoing connection. EES is supported on portables.

ESN Uniform Dialing Plan (S)

ESN provides Uniform Dialing Plan (UDP) and Coordinated Dialing Plan (CDP). Both of these dialing plans are transparent to portables.

Network Alternate Route Selection (S)

The NARS (Network Alternate Route Selection) feature provides a flexible networking package that offers: simple network access codes, uniform dialing plan, digit manipulation, automatic least-cost routing, time-of-day routing, automatic on-net to off-net overflow, network control through NCOS, TCOS and FRL, routing control through NCOS based on special TOD schedule, 11 digit translation, Free Calling Area Screening, Expensive Route Warning Tone, Tandem Tie Trunk Network Dial Tone Detection, Network speed call.

These features are transparent to portable users.

Network Call Transfer (P)

ESN Network Call Transfer allows transferring a call back to the originating switch without requiring the use of tie trunks between the two switches after the transfer is completed.

A portable can initiate Network Call Transfer, and a call originated from a portable can be transferred. The portable display will not be updated accordingly.

Network Class of Service (NCOS) (S)

NCOS is an ESN software capability which provides the means to control user access to routes, eligibility of queuing, eligibility for receiving Expensive Route Warning Tone(ERWT), and eligibility to access network speed call.

A portable TN can be assigned an NCOS value for controlling its access to routes, eligibility for queueing, eligibility for receiving ERWT and access to network speed call.

Network Control Signaling (S)

Network Control at a Meridian 1 ESN node provides a Traveling Class of Service (TCOS) mechanism. The TCOS is the FRL of a user's assigned NCOS. When a user at an Meridian 1 ESN node initiates a call to another Meridian 1 ESN Node, the TCOS is transmitted to the other Meridian 1 ESN node. At the receiving Meridian 1 ESN node, the TCOS replaces the FRL of the NCOS assigned to the incoming trunk group. Route access for the call are therefore based on the NCOS of the incoming trunk group with the modified FRL.

This capability is applied to a portable DN initiating such a call.

Network Ring Again (U)

Network Ring Again supports access to Ring Again across a network. A portable encountering a busy wired set cannot activate Network Ring Again. However, a wired set encountering a busy portable can use the Network Ring Again feature.

Enhanced Flexible Hotline (P)

Flexible Hotline enables a single-line set with MaNuaL service (MNL) to place calls directly to a predetermined destination by simply going off hook. Enhanced Flexible Hotline extends this capability to SL-1/Digital sets through a HOT key. In addition, single-line sets with Enhanced Hotline Allowed (EHTA) are given access to Call Transfer, Call Waiting, Call Park, Attendant Recall, Ring Again, and Conference.

A portable can receive a Hotline call; that is, a portable DN can be defined as a Hotline number. However, a portable cannot make a Hotline call.

Hunting (P)

Hunting allows calls which encounter busy DNs to be automatically routed to another DN. Hunting continues along a hunt chain until an idle DN is found, the end of the hunt chain is reached, or the maximum number of hunt steps is exhausted. Short Hunt hunts along the DN keys defined on a station.

The following three types of hunt chains are supported for calls terminating to portables

- Circular hunting
- Linear hunting
- Secretarial hunting

Short hunting is not applicable to portables, which supports only a single directory number.

All four types of hunting can be applied to calls originated from portables.

INIT ACD Queue Call Restore (S)

INIT ACD Queue Call Restore enables the Meridian 1 system to restore transient calls in the ACD queues in the event of a system initialization. It only restores trunk originated calls and virtual calls will not be restored.

This feature is transparent to an incoming trunk call originated by a portable.

Intercept (P)

Intercept treatments can be defined in the customer data block to handle calls that cannot be completed due to call restrictions or dialing irregularities. A variety of treatments can be specified for calls from four categories of originating party: station or DISA calls, attendant-extended calls, TIE trunk or attendant-originated calls, and CCSA or DID trunk calls. Five kinds of treatment can be given, namely, route to attendant, provide busy tone, not applicable, provide overflow tone, and route to recorded announcement.

A portable-originated call encountering Intercept is given intercept treatment. For a call terminating to a portable DN in maintenance busy mode, existing Maintenance Busy Numbers (MBNR) intercept treatment is executed.

Precedence Intercept treatments can be defined specifically for precedence calls with the Station Loop Preemption package equipped. Alternatives are to intercept uncompleted calls to the attendant, provide recorded announcement, provide overflow tone, and intercept to a Central Precedence Answering Station (CPAS). Precedence Intercept treatments are not supported for portable terminals, so a CPAS DN *cannot* be a portable DN.

ISDN Primary Rate Interface

Accessing ISDN PRI trunks for a basic call is transparent to the portables. However, there are some features on the ISDN PRI that may not be available to the portables. The potential interactions are described below.

Basic call, North America ISDN PRA connectivity (S)

North America ISDN PRA supports connectivity to Meridian 1, DMS, 4ESS and 5ESS.

Access to North America ISDN PRA connectivity (for a basic call) from portables is supported.

Calling Line Identification (P)

The CLID is transported across the ISDN PRI to or from a portable, or both to and from.

Call Redirection Service (P)

The ISDN PRI Call Redirection Service provides the ability to redirect a call across the ISDN PRI network (through Call Forward, Call Forward No Answer, Transfer, and other actions). Call redirection indications are also presented to the party receiving the call redirection and the party being redirected.

The Microcellular system supports Call Redirection Service as follows:

- Incoming calls to portables can be redirected across PRI via Call Forward, Call Forward No Answer, and Call Transfer.
- A portable involved in a call can be redirected by a wireline set across the ISDN PRI network. Any call redirection indication, however, is not provided on the portable, although this indication is presented to other parties where applicable.

Network Call Party Name Display (NCPND) (P)

NCPND is a networking feature which provides for the display of the calling party's name on the terminating set, and the called party's name on the calling set.

The portable DNs can have their names defined in the CPND database through overlay 95. In a call across ISDN PRI network involving portables, the call party names (calling name and connected name) can be transported across the ISDN PRI network. This is transparent to the portables. However, display of the calling name on a portable is not supported.

Malicious Call Trace (U)

Malicious Call Trace provides users with the capability to activate a call trace that results in a printed report of the calling and called parties (TNs). The report is generated on system maintenance TTYs. Malicious Call Trace is activated either through dial access (SPRE + XX) or by pressing the TRC feature key.

Malicious Call Trace is not supported on portables; however, a wireline terminal can activate the feature to trace a call connected to a portable (the virtual TN associated with the portable is used).

Message Waiting Indication (MWI) Interworking with DMS 100 (S)

Message Waiting Indication (MWI) Interworking provides a mean to pass the Message Waiting Indicator across a private network with the following types of systems: Meridian 1, DMS-100, DMS-250, and SL-100. This feature is compatible with Meridian 1 Network Message Services. With this feature, a single message system can serve a network with both Meridian 1 and DMS systems.

This feature is provided to portables.

Messaging Centers

There are various integrated messaging services offered on the Meridian 1. These messaging services include automated system and manual systems for voice and text: IMS/IVMS, Meridian Mail, and Message Waiting.

Some messaging services are supported and others are partially supported on portables. The Meridian 1 can send messages to a portable indicating whether there is an unretrieved message in the mailbox. Depending on the characteristics of the portable, the visual indication presented to the user can be in the form of a message waiting lamp, an icon, a message, or other indicator. The Meridian 1 cannot provide such information as the number of unretrieved messages to the portable user.

IMS/IVMS (S)

IMS/IVMS is an automatic text/voice messaging system. It allows the caller to leave a text/voice message for the called party to retrieve at any time and to access various other options.

Calls originated from a portable can be redirected to IMS/IVMS. The portable user can then leave a voice message for the called party. Calls terminating on a portable can be redirected to IMS/IVMS DN (for example, through CFW All Calls), and the portable user can retrieve the messages by dialing the IMS/IVMS DN to access the messaging system.

Meridian Mail (S)

Meridian Mail is an automated voice messaging system. It allows the caller to leave a voice message for the called party to retrieve at any time and to access various other options.

Meridian Mail is supported on portables on a per DN basis. A call terminating to a portable can be redirected to the NMS-MM through call redirections. A call originated from a portable can also be redirected to the NMS-MM through call modifications defined on the terminating set. A portable can retrieve its messages by dialing the NMS-MM DN to access its mailbox.

Message Waiting Center (P)

This capability is applicable to manual message centers. In the Meridian 1, three types of sets can be configured as the message center: Attendant Console, SL-1 set, and ACD set.

A portable cannot be configured as a Message Center because the associated MIK/MCK key lamp pairs cannot be defined on the portable.

A call terminating on a portable can be redirected to a Message Waiting Center, and messages at the Message Waiting Center can be retrieved by the portable user.

Furthermore, a call originated from a portable can be redirected to the Message Center and the portable user can leave a message for the called party.

Multiple Appearance Directory Number (P)

The Meridian 1 allows the same DN to be assigned to BCS, BRI, and 500/2500 sets. Two types of call arrangement can be defined: single call arrangement and multiple call arrangement.

Multiple Appearance DN is supported for portables. However, the Meridian 1 does not have control over ringing on portables. Thus, only Multiple Call Ringing DN (MCR) and Single Call Ringing DN (SCR) can be configured on portables. In addition, configuration of Multiple Call No-Ringing DN (MCN) or Single Call No-Ringing DN (SCN) for portables is blocked during service change.

Since a BRI DN cannot be mixed with any other types of set, the same DN cannot appear on both a portable and a BRI terminal.

Multi-Customer (S)

The Multi-Customer feature allows a single Meridian 1 to be divided into multiple customer groups.

Portables can be grouped into different customers, along with wireline sets.

Music Package/Enhanced Music (S)

The Music Package supports two capabilities: Music on Hold (for incoming calls from CO, FX, WATS, DID or TIE trunk routes) and ACD Music on Delay. Enhanced Music Package extends the Music on Hold feature to provide music in other situations as well (for example, stations placed on hold by other stations and calls placed on consultation hold).

Music on Hold is provided to portables, and calls put on hold by a portable can receive music.

Network Message Services

Network Message Services include Meridian Mail, Message Centers, and TRO Before Answer.

Meridian Mail (S)

A call originated from a portable can be redirected to the NMS-MM through call modifications defined on the terminating set. Calls terminating on a portable can be redirected to Network Message Services - Meridian Mail (NMS-MM) through call modifications.

The Meridian 1 can send messages to a portable indicating whether there is an unretrieved message in the mailbox. Depending on the characteristics of the portable, the visual indication presented to the user can be in the form of a message waiting lamp, an icon, a message, or others. The Meridian 1 cannot display such information as the number of unretrieved messages on a portable.

Message Centers (P)

These capabilities are applicable to manual message centers. In the Meridian 1, three types of sets can be configured as the message center: Attendant Console, SL-1 set, and ACD set. A portable cannot be configured as a Message Center due to lack of key/lamp pair support. However, a call terminating to a portable can be redirected to a NMS-MC and a call originated from a portable can be redirected to a Message Center through call modifications defined on the terminating set.

The message waiting indication provided to portables is the same as described above for Meridian Mail.

TRO Before Answer (S)

TRO Before Answer provides trunk optimization before call establishment for PRA calls that are redirected through Call Forward All Calls, Call Forward No Answer, Call Forward Busy, or Hunting.

This feature is supported for portable calls.

Night Service/TAFAS (P)

Night Service permits incoming calls, normally directed to the attendant, to be routed to a defined destination when the console is put into Night Service. Three types of Night Service are provided: Selected Trunks to Selected DN's, Customer or Console Presentation Group (CPG) Night DN's, and Trunk Answer From Any Station (TAFAS) where a bell (or other alerting device) is alerted so that any user can dial a SPRE code to answer the call.

A portable-originated call terminating to an attendant console in Night Service is routed through the Customer Night DN's. The portable display is updated of the call modification.

A portable can be defined as a Night DN and accessed through TAFAS; however, a portable cannot access a TAFAS Night call with Special Prefix (SPRE).

One Number Call Delivery (S)

One Number Call Delivery on a Microcellular system allows a mobile user to publish only their office directory number (DN) and still be reached whether the user is in-building or off-site. Two configurations are available:

- 1 Ring Micro First: Calls will be delivered to the user in-building. If not answered, the call is forwarded to the macrocellular network. If the user doesn't answer (or is out of range), the call will be sent to the user's PBX voice mail (or other preferred call treatment).
- 2 Ring Macro First: Calls will be first sent to the user's macrocellular number when the office DN is dialed. If not answered, the call will be routed back to the user's office DN and then to the user's PBX voice mail (or other preferred call treatment).

Pretranslation (S)

Pretranslation uses the Speed Call List to allow one-digit codes to be translated into a DN; furthermore, pretranslation access restriction and digit manipulation can be specified. Stations can be arranged into Pretranslation groups on a TN basis.

Portables can be part of a pretranslation group and can invoke the Pretranslation feature. The one-digit code entered from a portable is pretranslated into a DN before termination is attempted.

A portable DN can also be defined as a translated DN in a Speed Call List. Features applicable to the portable will then govern the call.

Recorded Announcement (S)

The Recorded Announcement (RAN) feature enables the Meridian 1 system to connect applicable calls automatically to a recorded announcement machine that the customer provides. A customer can specify up to five different intercept conditions that result in connection to a RAN.

Portables can be connected to a RAN and receive the recorded announcement through intercept conditions, Recorded Attendant Overflow Announcement, or ACD RAN.

Recorded Announcement for calls diverted to external trunks (S)

Recorded Announcement (RAN) for calls diverted to external trunks (RANX) offers a recorded announcement when the response time is long due to the call being forwarded to an external CO-route. The forwarding can be Call forward all calls, Call forward no answer, Call forward busy, Internal call forward, Second level Call Forward or Hunt. The announcement notifies the calling party that an external call forward is taking place. The message is given if the outgoing route supports the RANX feature.

This feature is transparent to portables.

Recorded Announcement in ACD Queue (P)

Recorded announcements can be provided to callers waiting in an ACD queue. A portable-originated call can be terminated to an ACD queue. With answer supervision on the RAN trunk, the call state of the portable terminal becomes CONNECT once the call is connected to RAN; without answer supervision, the call will remain in the ALERTING state until the call is actually answered by an agent. While the portable is in the ALERTING state, the user will hear ringback.

Secretarial Filtering (S)

Secretarial Filtering is an application of Call Forward All Calls. It enables you to forward all calls to a second telephone. The user at the second telephone answers the forwarded calls and can choose to transfer the call back to you.

This feature is supported on portables.

Speed Call /System Speed Call (P)

The Speed Call feature allows a user to place calls by dialing a one-, two- or three- digit code. System Speed Call extends the capabilities of the Speed Call feature; it allows a user temporarily to override class of service and access restrictions for calls placed using the system speed call list.

Because most Microcellular portables support directory number storage at the set level, the basic Speed Call feature is not supported since not much value would be added.

The ability to access a shared System Speed Call list may still be important to a portable user. Therefore, portables can be designated as a System Speed Call User only and can access one System Speed Call list. Portables cannot be configured as System speed Call Controllers.

User Selectable Call Redirection (P)

This feature enables the user to modify DN's at the telephone for the following redirections: Flexible Call Forward No Answer DN, Hunt DN, External Flexible Call Forward No Answer DN, and External Hunt DN. In addition, this feature provides three different numbers of ringing cycles before Call Forward No Answer treatment is given.

A craftsperson can change the Ringing Cycle Option (RCO) for the portable. No other aspects of the User Selectable Call Redirection feature are supported.

Timed Forced Disconnect (S)

This feature prevents the paging system from being locked up by a user or an operator. A variable timer within the Meridian 1 is provided as a customer option; it limits the time a user may access the paging trunk. When the timer expires, the call connected to the paging trunk is force disconnected.

Timed Forced Disconnect applies to portables accessing a paging trunk.

Trunk Anti-Tromboning (S)

TRO After Answer performs an anti-tromboning operation to eliminate the tromboning of PRA B channels or ISL trunks after the call is answered.

This feature is transparent to portables on active calls.

Wireless Privacy (S)

Wireless Privacy ensures that calls presented to a Multiple Appearance Directory Number (MADN) cannot be accessed on more than one set at a time.

Privacy is supported for portables. When Privacy is activated, if a user answers a call on a portable, the call ceases to appear on the desk set, thus ensuring the privacy of the conversation.

Appendix B: Meridian Administration Tool (MAT)

The Meridian Administration Tool (MAT) consists of an IBM-compatible 80486 or better system running Microsoft Windows 95 and the MAT software connected to a Meridian 1 system via a serial port, either through Ethernet or through a modem.

This appendix provides a brief description of the MAT for Microcellular OA&M. For more information, see the *Meridian Administration Tools Common Services User guide* (A0658266).

MAT shell

The MAT shell is the primary MAT application that resides on the client PC. This shell controls access to all MAT OA&M applications (including the Microcellular OA&M client application).

Alarm management

The alarm management application on the MAT enables users to configure the alarm management server for a given site. It enables users to specify which alarms to display as well as how to categorize each alarm (critical, major, or minor). In addition, this tool enables users to view and to clear active alarms.

The alarm management application on the Meridian 1 core functions as the alarm management server. This application logs all system alarms and performs the necessary actions based on incoming alarms. In addition, it provides some general alarm management services such as alarm filtering and critical alarm notification to the MAT alarm management application. The alarm manager logs all applicable Microcellular alarms.

Log browser

The log browser application on the client enables users to view log files, such as the history file and site administration log. Although operational measurements and traffic information are also logged data, users view this information through Microcellular traffic and measurement applications. User can view other Microcellular-related log information through the log browser.

MAT provides a logging service that applications can use to store permanent information, such as performance data. Applications can use the services of the log manager to store information and to obtain a copy of application-specific information.

The Mobility System Management application uses this logging service to store all performance and accounting information and to obtain a copy of logged information for reports.

MAT access

The MAT platform provides access, or communication, services between the MAT and the Meridian 1 core software. This enables Microcellular applications that run on the MAT and Microcellular applications that run on the Meridian 1 system to communicate with each other.

Session control

When a MAT application runs for a particular site, the session manager creates a unique session ID for that application. All messages between the MAT application and the Meridian 1 core software use this session ID. The MAT application manages, validates, and provides access to session IDs. The Microcellular application on the MAT receives a session ID when it starts running. When it terminates, the application notifies the session manager so that it can delete the application's session ID.

Lock management

The lock management facility is a service that MAT provides to prevent simultaneous access to objects during a destructive operation, such as write. An application should use the lock manager to lock all objects before performing a destructive operation and to release object locks when the destructive operation is complete.

List of terms

ACELP

Algebraic Code Excited Linear Predictive, a method of implementing EFRC (Enhanced Full Rate Codec) in TDMA systems for improved digital voice quality. TDMA-3 ACELP implements the IS-641 protocol in IS-136 systems. A Microcellular system can support both ACELP and VSELP users. See also *IS-136*, *IS-641*, and *VSELP*.

administration reports

Administrative data is available on *component reports* and *connectivity reports*. Users can schedule reports to run at designated times.

AFP

See *Automatic Frequency Planning*.

AFP region

A Microcellular system component that is the parent of one or more AFP Stations.

AFPS

See *Automatic Frequency Planning Station*.

alarm panel

An EIMC Base Code element that an application uses to post an alarm condition that pertains to hardware, software bugs, protocol violations, or resource allocation problems. Alarm messages contain a source device, an alarm type, a severity code, an alarm code, and a text string.

AML

Application Module Link. An SDI device that provides user interface or access point to a software program (LD 48). Provides supervisory and control functions for the link that allows host computers and other external processors access to ISDN network services on Meridian 1.

AMO

Antenna Matrix/Oscillator.

AMPS

Advanced Mobile Phone System. A mobile telephone service with numerous cells in a single area that uses a cellular system of low power radio stations and a mobile telephone switching office. Linked by cable to similar transmitters operating at different frequencies in other areas.

antenna matrix (4 x 4)

The elements internal to the MBS that allow all 4 internal TRU-IIs to be connected to all 4 antenna ports.

antenna structure

The antenna elements, external to the MBS, including the antennas, cables, and hybrids (splitters/combiners).

APL

Applications Processor Link. A full-duplex asynchronous data transmission channel that can accommodate a baud rate up to 4800.

APS

Alarm and Power Supply Module, part of the MBS assembly.

ASI

Abstract Server Interface.

ASIC

Application Specific Integrated Circuit. A microprocessor chip designed to do specific tasks more quickly and efficiently than a generic processor.

ATI

Abstract Transport Interface.

ATL

Active Terminal Link.

authentication

The mechanism by which the identity of a portable is confirmed using secure means. This procedure is normally initiated before each time the portable obtains any sort of service (including each call setup).

Automatic Frequency Planning (AFP)

A feature of the Microcellular system that automates the assignment and adjustment of microcell operating frequencies so that they do not interfere with the macrocellular system.

Automatic Frequency Planning Station (AFPS)

A scanner/receiver connected to the Meridian 1 system that measures forward and reverse RSSI on specified channels, extracts information from macrocell channels, and returns the Bit Error Rate on specified Microcellular control channels. The AFPS helps the cellular operator determine what channels are available for the Microcellular system to use.

AXI

Abstract Switching Interface.

Base Station

See *Microcellular Base Station*.

basic call setup (portables)

Establishing and completing or aborting an outgoing call from a portable, or having an incoming call terminated to the portable.

BCS

SL1 and digital sets.

BHCA

Busy Hour Call Attempt.

BIST

Built-in self-test

BRI

(ISDN) Basic Rate Interface. One of two ISDN interfaces, the BRI has two B (bearer) channels at 64 kb/s and a D (data) channel at 16 kb/s.

BRSC

Basic Rate Signaling Concentrator. Carries out the ISDN BRI data link and network layer processing functions; transmits resulting messages to the MISP.

CAI

See Common Air Interface.

call delivery

Terminating a call to the mobile system subscriber regardless of location.

CAST

Customer Application System Test; group within Northern Telecom.

CC

Call Control (of ASI).

CCITT

Comité Consultatif International Télégraphie et Téléphone.

CCS

Centi call seconds. A unit of traffic measurement equal to 100 call seconds. A 5-minute call equals 3.0 CCS.

CCSA

Controlled Class of Service Allowed.

CCSD

Controlled Class of Service Denied.

CDN

Controlled directory number.

CDPD

Cellular digital packet data.

cell

The portion of a zone, or radio coverage area, served by a control-channel radio and from one to 15 traffic radios. A cell is also called a partition. Cell sizes vary with layout and building architecture. Portables use only one Common Air Interface (CAI) radio protocol within a cell; if both IS-136 and IS-54B portables operate in the same cell, all of them use the IS-54B protocol.

cellco

See cellular company.

Cellco Mobility Control Point

See CMCP.

cellular

Mobility systems using radio techniques that provide wide coverage by splitting regions into cells and having adjacent cells use different frequencies. Includes both macrocellular and microcellular systems.

cellular company

A cellular (operating) company holds a license to operate and control cellular equipment within a certain geographical region, using a defined range of frequencies. The cellular company must provide the frequencies that the Microcellular system uses. Operation of the Microcellular system continues only if a link is maintained between the Microcellular system and the CMCP. The cellular company can change the frequency allocation at any time.

cellular service provider

See cellular company.

Cellular Terminal Server

An application providing functions to control, access, and manage the IS-54B and IS1-36 radio protocols.

C/I or CIR

Carrier-to-Interference Ratio.

CISS

Connectionless Independent Supplementary Services (of ASI)

CLID

Calling Line ID (identification)

CLMS

Connectionless Message Server (of ASI)

CLS

Class of service.

CMCP

Cellco Mobility Control Point. A MAT-based application that provides the cellular company with control over the use of frequencies by the Microcellular systems within its licensed region. Communicates with the MNCP (Meridian 1 Network Control Point) through a modem (PPP) connection.

CMDU

Core Multi-Drive Unit. Performs MDU functions for Call Processor storage. Provides a backup for programs and data stored in system memory.

codec

Coder/decoder, a device that performs a coding function (for example, analog to digital) in one direction and a decoding function (digital to analog) in the other direction.

Common Air Interface (CAI)

A uniform set of radio protocols. See also *IS-54B*, *IS-136*, and *IS-641*.

component reports

A type of administrative report that displays configuration information about a Microcellular component or a group of components. Attributes shown include date and time created, creator, date and time of last change, ID, parent components, and last calibration date.

COMS

Connection-Oriented Message Service (of ASI).

connectivity reports

A type of administrative report that displays information about the connectivity of Microcellular components. Can contain information about the connectivity of a single component or the entire subsystem.

Core

See Meridian 1 Core software.

Core features

Some Meridian 1 features, such as Call Forward All Calls and Transfer, that portable users can use for management and convenience.

Core Microcellular Set Model

Built on top of the BCS Set Model, serves as the Core's data abstraction of portables.

Core Microcellular switching

Provides call processing and switching capabilities to portables so that they can originate as well as receive voice calls; provides handoff capabilities.

Core MSP

Serves as an interface between the SL-1 Core and the MSP. Provides critical real-time Microcellular functionality not possible on the MSP itself.

COT

Central office trunk, a circuit between a telephone company's central office or local exchange trunk, and a PBX on a customer's premises.

CPU

Central processing unit, a card in the main portion of a computer that includes circuits controlling the interpretation, sequencing, and execution of instructions as the CPU receives them. Performs arithmetic logic.

CRC

Cyclic redundancy check, an error-detecting code defined as the remainder when the total number of serialized bits in the data to be checked is divided by a predetermined binary number.

CSMO

Compact Simplex Master Oscillator. A circuit that monitors and adjusts the master oscillator. See also *master oscillator*.

CSN

Canadian Switched Network.

CSU

Customer Service Unit. Provides a digital interface between a Meridian 1 PRI or DTI and T1 line when connecting to registered common carrier trunks.

CTAS

Customer Technical Assistance Service (Canadian).

CTS

Cellular Terminal Server.

CT-2

Cordless Telephone 2 (wireless protocol).

DCCH

Digital control channel.

DCH

D-channel (ISDN signaling link).

deregistration

The process of disabling a portable telephone from working on a wireless system.

DID

Direct Inward Dialing.

directory number

See *DN*.

distributed antenna system

A collection of antennas located throughout a cell.

DLC

Digital Line Card, a Meridian 1 card that gives the AFP software on the local MSM MAT access to AFP Stations as if they were Meridian 1 sets.

DMS

Digital Multiplex Switch.

DN

Directory Number. A number that a Meridian 1 system can assign to a single telephone or to multiple telephones, such as a portable telephone and a wireline set. See also *TN*.

downlink

The signal path for MBS to portable communication, in a forward channel.

DPNA

Direct Private Network Access.

DS0

Digital Signaling 0; standard 64 mb/s channel, 8-b8t PCM at 8 Hz sampling.

DS1

Digital Signaling 1; standard 1.544 Mb/s, containing 24 DS0s plus framing.

DS-30

Digital Signaling 30; DMS proprietary 2.048 Mb/s 30 DS0 + 2 control/frame.

DS-30X

Variant of DS-30 using 2.56 Mb/s, 32 channels with embedded control and framing.

DS-30X Switching Server

An EIMC Base Code element that serves as an interface to the XPEC card. Gives control of the DS-30X Switching Fabric to an application primarily to perform internal handoffs.

DSC

Distant Steering Code. An X11 software feature enhancement to the Coordinated Dialing Plan feature on Meridian 1 systems that allows CDP to route Direct Inward Dialed (DID) calls over central office (CO) and WATS trunks.

DSP

Digital Signal Processor. A specialized computer chip that performs speedy and complex operations on digitized waveforms. Useful in processing sound and video.

DTI

Digital Trunk Interface. A circuit card in some Meridian 1 systems that enables switching components to communicate with digital trunks at 1.5 Mbps.

DTMF

Dual Tone Multiple Frequency. A term describing push-button or Touch-tone dialing. Each signal represents a digit and has two different frequencies.

Dual 8-Port Hybrid

The Dual 8-Port Hybrid is a combiner/splitter with MBS-to-hybrid input ports and hybrid-to-antenna output ports on both sides. See also *Quad 4-Port Hybrid*.

EFRC

Enhanced Full Rate Codec. See also *ACELP* and *IS-641*.

EIA

Electronic Industries Association. A U.S. organization active in setting standards for manufacturers of electronic products; created the RS-232 and RS-449 interface standards, among others.

EIMC Application Manager

A Base Code element that enables, disables, and audits applications, triggers the process to download applications, and controls storage of applications.

ELCK

Electronic LoCK.

Embedded Intelligent Mobility Controller (EIMC)

The EIMC, an IPE circuit card, is the Microcellular system's wireless controller. This hardware pack is responsible for Layer 2 and Layer 3 processing as well as handoffs between different Microcellular Base Stations.

Enbloc Dialing

Same as predialing.

EPROM

Erasable Programmable Read-Only Memory.

EOD

End Of Dialing.

ERP

Effective Radiated Power. The power supplied to the antenna multiplied by the power gain of the antenna in a given direction.

ERWT

Expensive Route Warning Tone.

ESN

Electronic Serial Number/Electronic Switched Network. Each portable in a Microcellular system has an ESN that the system uses to locate the portable. A wireline set can share an ESN with a portable. See also *MIN*.

ETAS

Emergency Technical Assistance Support.

Extended Peripheral Equipment Controller

See *XPEC*.

external handoff

See *interzone handoff*.

EXUT

Enhanced Universal Trunk; a trunk card in Meridian 1 IPE modules.

FCC

Federal Communications Commission. A board of commissioners to regulate all interstate (but not intrastate) and foreign electrical telecommunications systems that originate in the United States.

FDLC

Forced DownLoad Control.

feature code string

A character string that a portable user enters to invoke or cancel a feature. See also *Mobility Feature code* and *Mobility Special Prefix code*.

FEPROM

Flash EPROM.

FFC

Flexible Feature Code. An optional X11 software package that provides customers with the capability to define their own user access codes for any feature otherwise accessed by the use of a Special Prefix (SPRE) Code.

firmware

Software that is installed into nonvolatile memory (hardware) during manufacture or field upgrade. Not downloadable.

foreign subscriber

User of a mobile system who is not a valid roamer within the system. Compare with *visiting subscriber*.

forward channel

A forward channel in a cell is for MBS to portable communications, using a downlink.

FTP

File Transfer Protocol. An industry standard protocol used to transfer files that operates in the fifth through seventh layer in the OSI (Open Systems Interconnection) LAN model.

GDLS

Global Dynamic Loss level Switching.

GUI

Graphical User Interface. Name for any computer interface that replaces characters with graphics; usually works with a mouse or trackball.

handoff

A feature within wireless systems that allows portables to be moved about while continuing to receive uninterrupted service. The system moves a call from one traffic channel to another, either within the same cell, to improve reception (“interference handoff”), or to the traffic channel of another cell, to allow mobility (“mobility handoff”). Also called “handover.”

HDLC

High Level Data Link Control. A bit-oriented data link layer line protocol created by ISO as a superset of IBM's SDLC.

heartbeat

Periodic signal between the CMCP and the Microcellular system.

HLR

Home Location Register.

HMI

Human Machine Interface.

home zone

Zone to which subscriber's calls are initially directed by the Microcellular system.

hybrid

A combiner/splitter with MBS-to-hybrid input ports and hybrid-to-antenna output ports. See also *Dual 8-Port Hybrid* and *Quad 4-Port Hybrid*.

ID

Identification number.

IE

Information Elements. The name for the data fields within an ISDN Layer 3 (Network Layer) message.

IMSI

International Mobile Station Identifier.

incoming call

A call that terminates (comes “in”) to a portable. The portable must be registered and in the ENABLE state to receive incoming calls. The originating party receives ringback while the portable is being located and radio-paged.

interzone handoff

A handoff that occurs between cells of two different zones. See also *handoff*.

Intrazone handoff

A handoff that occurs from one cell to another cell within the same zone. See also *handoff*.

IPC

Interprocess communications.

IPE

Intelligent peripheral equipment. Microcellular cards are installed on an IPE shelf in a Meridian 1 system.

IS-54B

Cellular System Dual-Mode Mobile Station—Base Station Compatibility Standard. IS-54B is a Common Air Interface (CAI) radio protocol that defines the interface for TDMA-3 and AMPS, with an analog control channel.

IS-136

Cellular System Dual-Mode Mobile Station—Base Station Compatibility Standard. IS-136 is a Common Air Interface (CAI) radio protocol that defines the interface for TDMA-3/VSELP and AMPS or TDMA-3/ACELP and AMPS, with either an analog control channel or a digital control channel. See also *ACELP* and *VSELP*.

IS-641

Cellular System Dual-Mode Mobile Station—Base Station Compatibility Standard. IS-641 is a Common Air Interface (CAI) radio protocol that defines the TDMA-3 ACELP implementation to incorporate EFRC into IS-136 systems. See also *ACELP*, *EFRC*, and *IS-136*.

ISDN

Integrated Services Digital Network. Switched digital network providing telephone company signaling information and user voice and data services over the same digital transmission and switching facilities.

ISO

International Standards Organization. An international committee that provides certification and recommendations to companies with regard to a variety of standards or quality procedures and how well each individual company follows them.

ITU

International Telecommunications Union (successor to CCITT). A specialized UN agency that tries to establish standardized communications procedures and practices.

IWF

Inter-Working Function.

IWU

Inter-Working Unit.

LAN

Local Area Network. A system linking multiple electronic devices, such as word processors, computers, and other office machines, to create an interoffice or intersite network.

LAPD

Link Access Protocol - D-channel. Circuit-level procedure development for ISDN connections; a CCITT data link layer protocol.

LCR

Locate Channel Receiver.

location update

Request by the system of the portable to perform a location registration.

Log Book

An EIMC Base Code element that is used by an application when it wishes to record a log entry, consisting of a log type, a log code, a log source, and a text string.

MACA

Mobile Assisted Channel Allocation.

macrocellular

Cells and cellular systems provided by cellular service providers using high power base stations with large cell sizes in the public domain.

MAHO

Mobile-assisted handoff.

master oscillator

A device that provides timing for the TRU-IIs (radios) and adjusts their frequencies.

MAT

Meridian Administration Tool. A MAT running Mobility System Management (MSM) is required for installation, operation, administration, and maintenance of the Microcellular system. A local MSM MAT connects to a Meridian 1 system through Ethernet, and a remote distributor MSM MAT can also connect to the Meridian 1 system. The CMCP application runs on a MAT. See also *Automatic Frequency Planning* and *Mobility System Management*.

MBS

See *Microcellular Base Station*.

MCDN

Meridian Customer Defined Networking. A set of telephone users, both local or remote, that are on an Electronic Switched Network that is specified by the customer, and who can call each other on special trunks (WATS, DID, TIE, etc.).

MCN

Multiple Call Non-ringing DN.

MCP

Mobility Control Point.

MCR

Multiple Call Ringing DN.

MCRA

See Multiple Call Arrangement Allowed.

MCRD

See Multiple Call Arrangement Denied.

MCS

Multimedia Communications Systems; also, processor daughter board of an EIMC.

MCU

Meridian Communications Unit, which gives the AFP application, running on the local MSM MAT, access to AFP Stations as if they were Meridian 1 handsets.

MDI

Multiple Document Interface.

MDPCTH

Mobile Dynamic Power Control Threshold High.

Meridian 1 C-Series

Meridian 1 Option 11C, 51C, 61C, 81, and 81C systems.

Meridian 1 Core software

The software components that reside on the CPU card, including the existing Meridian 1 software (Core Features) and the Mobility Service Provider (MSP), the Core MSP, the Core Mobility Set Model, Core Mobility Switching, the MISP Interface Handler, and the Object Request Broker.

Message Waiting Indicator

A visual or audible telephone set indicator that alerts the user to the fact that a message is waiting.

MFCO

See *Mobility Feature Code*.

microcell

Cell or cellular system that uses low-power base stations with smaller cell sizes, in either public or private domains. A cellular operating company must provide the frequencies that these systems use.

Microcellular Base Station (MBS)

The fixed part of a Microcellular system that is used to communicate with portable telephones using a radio interface. An MBS in a Microcellular system supports up to 4 TRU-Is, each of which can independently operate as a control-channel radio or a traffic-channel radio (dual-mode TDMA-3 voice/AMPS data).

Microcellular server

The Microcellular system server provides an abstracted interface to clients, hiding all radio standard specific messaging from the client. If the radio standard changes, no changes to the interface with the client are needed.

Microcellular Service Provider (MSP)

Provides access to call control and switching capabilities of portables, as well as access to features.

Microcellular Transcoder Card (MXC)

The MXC provides transcoding of voice within the Microcellular system and can support ACELP/VSELP voice coding or VSELP voice coding. See also *ACELP* and *VSELP*.

MIN

Mobile Identification Number. An MIN together with an ESN identifies each portable in a Microcellular system. See also *ESN*.

MISP

See *Multipurpose ISDN Signaling Processor*.

MISP/MSDL Interface Handler

Enables multitasking on the Meridian 1 Call Processor card.

MMIH

MISP and MSDL Interface Handler.

MMO

Meridian 1 Microcellular Option Package

MMT

Meridian Digital Set.

MOB

Mobility Routing Application.

mobile station

A part of a cellular system that you can use while in motion, such as a portable handset or headset.

Mobility Feature Code

A sequence of digits that a portable user enters to invoke a specific dial-access function.

Mobility Service Provider (MSP)

The MSP provides access to call control as well as access to Meridian 1 set features for portables.

Mobility Special Prefix

A customer-defined number of up to four digits that the portable user enters, instead of a SPRE code, to activate a dial-access feature. A Mobility Special Prefix code can include the digits 0-9 and the asterisk. The default code is an asterisk (*).

Mobility System Management (MSM)

An application that runs on a MAT for installation, operations, administration, and maintenance of a Microcellular system.

MOCM

Mobility Object Communications Model.

MOSR

Mobility Server Package. An external packet handler for processing packet data; resides on the MISP circuit card.

MPH

Meridian 1 Packet Handler.

MSC

Mobile Switching Center (same function as MTSO).

MSDL

Multipurpose Serial Data Link. A non-dedicated transmission connection on Meridian 1 systems to which data is sent one bit at a time; provides signaling interface for PRI D-channel or AML (Application Module Link) functions.

MSP

See Mobility Service Provider.

MSP Mobility Set Model

One of two main components of the Mobility Service Provider; acts as the MSP's data abstraction of portables in the system.

MSPRE

See Mobility Special Prefix code.

MSX

Microcellular Speech Transcoder.

MTBF

Mean Time Between Failures. A measure of reliability; the length of time that a user may reasonably expect a device or system to work (uptime) before an incapacitating fault occurs.

MTSO

Mobile Telephone Switching Office (same function as MSC).

MTTR

Mean Time To Repair. The downtime, or average time required for corrective maintenance, including diagnosis.

MTX

Mobile Telephone Exchange. The cellular telephone system operated by the cellular service provider, with up to 50,000 subscribers.

Multipurpose ISDN Signaling Processor (MISP)

A Meridian 1 card, on an Option 51C, 61C, 81, or 81C system, that provides a communications interface between the Core Processor and peripheral devices. An MISP supplies routing and message relay between the Meridian 1 Call Processor (CP) card and to up to 8 EIMCs.

Multiple Appearance Directory Number (MADN)

MADN is a feature that allows the assignment of the same telephone number to a number of lines that are wired to the host switch. An incoming call rings on all the telephones and can be answered on any. Only one call can be active on all lines assigned to the host switch telephone number.

Multiple Call Arrangement Allowed

Allows access to a conversation on a portable from the corresponding wireline set. The wireline user can listen in on the portable telephone user's calls.

Multiple Call Arrangement Denied (Wireless Privacy)

Prevents access to a conversation on a portable telephone from the corresponding wireline set. The portable telephone user can originate and receive calls when a set sharing the same DN is on a call.

MWI

See Message Waiting Indicator.

MXC

See Microcellular Transcoder Card.

NIUF

ISDN User Forum.

NPS

Northern Procurement Specifications.

NT

Northern Telecom.

NTP

Northern Telecom Publications; Meridian 1 and DMS system documentation.

OA&M

Operations, Administration, and Maintenance. Microcellular OA&M consists of a number of distributed OA&M components that control different aspects of the required functionality, including the Meridian 1 Core software and the Mobility System Management application on the MAT.

Object Oriented Message Transport

An EIMC Base Code entity that enables communication between the EIMCs and the MXCs.

Object Request Broker

Enables communications between objects within object-oriented applications, including communications between entities on the Meridian 1 Core and those on the EIMC.

OEM

Original Equipment Manufacturer.

OM

Operation Measurement. Data stored by Meridian 1 applications to provide information on system usage.

OOATI

Object-Oriented Abstract Transport Interface.

OOLR

Overall Objective Loudness Rating.

OOMT

See *Object-Oriented Message Transport*.

ORB

See *Object Request Broker*.

OTAR

Over-The-Air Registration.

OS

Operating System.

OSS

Operator's Support System. Software programs used by telephone companies to manage their voice communications equipment/networks.

outgoing call

A call that originates ("goes out") from a portable. When in the ENABLED state, a portable receives a ringback tone upon completion of dialing. Depending on system and terminal configurations, such as restriction level, certain outgoing calls might be denied.

P/A

Paging/Access radio (each cell required at least one, for control).

PAD

Packet Assembler/Disassembler. Device that enables stop-start mode data terminal equipment (DTEs) not equipped for packet switching so that the data can be handled by a packet-switched network.

Pad Value

The Loss Level Control value.

partition

See *cell*.

PBX

Private Branch Exchange. A telephone system, owned by and installed on the premises of a business customer for use with an attendant console.

PDN

Personal directory number. The main number or extension on any telephone in the Meridian 1 system.

PE

Peripheral Equipment. A hardware subsystem that provides telephone and trunk terminals and the shelves on which these cards reside; interfaces between the network equipment and the stations or trunks.

PCM

Pulse Code Modulation.

physical TN (PHYTN)

The TN that is linked with a virtual TN to provide the physical location of a portable set. Specifies the MXC DS-30X timeslot through which the portable is communicating at a given time.

PM

Performance measurement.

portable

Any Microcellular wireless set (portable telephone). A portable is the equivalent of an IS-136 or IS-54B “mobile station.”

The Microcellular system is designed for class 3 and 4 portables, which have a power output of 600 mwatts. (Class 1 portables, used as car phones, have a power output of 3 watts. Class 2 portables have a power output of 1.2 watts.

POSIX

Portable Operating System Interface, based on UNIX.

PPP

Point-to-Point protocol.

PRI

(ISDN) Primary Rate Interface having 23B + D format. Its digital trunk interface is at 1.5 Mbps.

primary surge protector

A voltage surge protector connected between each line conductor and ground located where telecommunications conductors enter a building structure. See also *supplemental power surge protector*.

PSDL

Peripheral software downLoad. Refers to reading computer programs or data that is related to peripheral equipment into a CPU.

PSTN

Public Switched Telephone Network. Consists of a location for customer equipment, a local loop, a local exchange area, interexchange transmission media, and a network switching area.

PSU

Power Supply Unit.

PUA

Pick-Up Allowed.

Quad 4-Port Hybrid

The Quad 4-Port Hybrid is a combiner/splitter with four MBS-to-hybrid input ports on one side and four hybrid-to-antenna output ports on the other side. See also *Dual 8-Port Hybrid*.

radio

See *TRU-II*.

Radio Line Card

See *Microcellular Transcoder Card*.

radio link

A radio channel between a Microcellular Base Station and a portable.

RAM

Random access memory, a storage system such as computer volatile memory, accessible by the user for either storing or retrieving information.

RDB

Route Data Block, Trunk Route Administration, is used to enter access codes, Call Detail Recording (CDR) information, network trunk features, route number, trunk route type, and trunking features regarding timing, scheduling, and starting arrangements.

registration

The process in which a mobile station (portable) informs the system of its presence in a cell and requests permission to use the system's services. Includes both initial registration (upon entering a cell) and location registration (when moving between cells).

reverse channel

A reverse channel in a cell is for portable to MBS communications, using an uplink.

RF

Radio frequency, a frequency of the electromagnetic spectrum normally associated with radio wave propagation, usually above 150 kHz.

RLR

Receive Loudness Rating (in dB).

roaming

The ability of Microcellular system subscribers to be served by systems outside of their home system while still having many of the same capabilities that they would have in their home system (as opposed to call delivery, which refers to terminating a call to the subscriber regardless of location).

ROLR

Receive Objective Loudness Rating.

ROM

Read-Only Memory.

RPI

Remote Power Interconnect Unit, either RPI8 or RPI16.

RSSI

Received Signal Strength Indicator.

RTOS

Real Time Operating System. An operating system in which the results of operations being processed influence future operations and results.

SCN

Single Call No-Ringing DN.

SCORE

Small-system CORE.

SCR

Single Call Ringing DN

secondary power surge protector

See supplemental power surge protector.

session control

One of two of the MSP's main components; manages the MSP's call session and feature session.

set model

The set model for a portable is the portable's data abstraction. Set models for portables will reside in both the Meridian 1 Core software and the MSP.

SID

System identifier, a numeric or alphanumeric SID identifies the Meridian 1 system that includes the Microcellular system.

SILC

S/T Interface line card (Meridian 1 line card for ISDN). Provides a globally accepted interface to ISDN BRI compatible terminals and supports up to eight DSLs (Digital Subscriber Loops), with 20 logical terminals on each.

SISP

Small System ISDN Signaling Processor card.

site planning

The process of positioning the Microcellular Base Stations, antennas, and other hardware in the system to maximize coverage for the portable telephones and minimize the number of Microcellular Base Stations required for acceptable performance. For detailed information on site planning, see the *Nortel COMPANION Microcellular Site planning and deployment guide* (553-3611-105).

SLA

Send Loudness Rating (in dB).

SNMP

Simple Network Management Protocol. A protocol for transfer of network management information and monitoring network components and their operation; created for use in TCP/IP networks.

SOC

System Operator Code.

SPRE

Special prefix, a code that customers use to access certain features from telephone sets within a system.

SRAM

Static RAM, a type of semiconductor memory chip that is characterized by its fast access time; does not need refresh circuitry required by Dynamic Random Access Memory (DRAM).

SSD

Scanning and signal distribution.

supplemental power surge protector

A series-connected overcurrent protector, with optional voltage surge protection, located between a primary protector and the equipment. See also *primary power surge protector*.

SYCOM

System core commercial; temporary name for SCORE card with Thor Processor in option 11C.

system version

The version number of the system software currently running on the system.

TAT

Trunk Anti-Tromboning. Performs an anti-tromboning operation to eliminate the tromboning of PRA B channels or ISL trunks after a call is answered.

TCM

Time Compression Multiplexing, which combines two or more information channels into a single transmission channel by assigning each information channel an exclusive, but short, periodic-transmission time interval.

TCM cable

Single twisted pairs of wires that provide a loop interface between an MBS, AFP Station, or MCU and a Meridian 1 system.

TCOS

Traveling Class Of Service.

TCP/IP

Transmission Control Protocol/Internet Protocol. Set of protocols designed to link a variety of computers over different types of networks; a four-layer transmission system.

TDMA

Time Division Multiple Access. Used for through-the-air transmission used by cellular telephone systems.

TDMA-3

Uses TDMA Digital Traffic Channels with paired timeslots to provide three full-rate traffic channels per pair of transmit/receive RF channels (for example, 13 kb/s user data, 16.2 kb/s gross, in each direction).

TDPCT

Terminal Dynamic Power Control Threshold.

TIE

Point-to-point trunk. A dedicated private communications line or trunk leased from a common carrier that connects two PBXs without using the public network. May be incoming only, outgoing only, or two-way transmission of voice and data information and made of copper wire, cable, or optical fiber.

TN

Terminal number, a network loop number in the X11 system database for each station. It is a physical or hardware address of a line or a trunk in the Meridian 1 peripheral equipment.

TOLR

Transmit Objective Loudness Rating.

transcoder

A device that converts between two different coding schemes. See also *Microcellular Transcoder Card*.

TRO

Trunk optimization.

TRU-II

Transmit Receive Unit II, a radio in a Microcellular Base Station. A TRU-II provides both the Tx and Rx RF channels for a single duplex link (control channel or traffic channel). Two Rx paths provide antenna diversity.

TSC

Trunk Steering Code.

TTN

Trunk terminal number.

uplink

The signal path for portable to MBS communications, in a reverse channel.

UPS

Uninterruptible power supply, an optional auxiliary power unit for Meridian 1 systems, using stored energy. Usually consists of a power supply that charges a battery, and an inverter that provides AC power from the battery.

VCH

Voice channel.

version number

See *system version*.

virtual TN (VTN)

A TN that call-processing software uses to uniquely identify a portable. Not associated with any physical hardware.

visiting subscriber

User of a mobile station who is a valid roamer within the system, but whose home system is a different system. Compare with *foreign subscriber*.

VLR

Visitor Location Register.

VNR

Via Net Loss. Loss occurring in analog facilities proportional to distance. Lowest loss at which a trunk facility may be operated.

Vocoder

Voice codec or transcoder. A device used to compress the frequency bandwidth requirement of voice communications.

VSELP

Vector Sum Excited Linear Predictive, a method of TDMA-3 voice coding implemented in the IS-136 protocol. See also *ACELP* and *IS-136*.

VTN

See *Virtual TN* (terminal number).

Wireless Privacy

See *Multiple Call Arrangement Denied (Wireless Privacy)*.

wireline set

Any telephone set whose operation requires a physical connection from the set.

WTS

Wireless Terminal Server.

WTSI

Wireless Abstract Terminal Server Interface.

XDLC

Extended Digital Line Card, 6-unit and IPE-based, in Meridian 1 systems.

XEM

IPE E&M Trunk Card.

XMLC

IPE 500-line card with message waiting (usually called “message waiting line card”).

XNET

Extended Network card on Meridian 1 systems.

XPEC

Extended Peripheral Equipment Controller card on Options 51C, 61C, 81, and 81C. Provides local switching capabilities to portables.

zone

A group of cells that a single EIMC controls, including the geographical area that the cells cover.

zone controller

The EIMC that controls a zone.

Index

Numerics

500/2500 Disconnect For Outgoing Calls, 126
500/2500 Line Disconnect, 125

A

abnormal operations, 124
Access Restrictions, 126
Access to Paging, 126
Access to Recorded Telephone Dictation, 126
ACD Agent/Supervisor, 127
ACELP
 definition, 151
 EFRFC implementation, 3
 IS-651 implementation, 3
 See also EFRFC.
Add AFP Station dialog box, 77
administering MBSs, 63
administering radios, 68
administration tasks, 19
AFP
 See Automatic Frequency Planning.
AFP Commands Log window, 80
AFP region
 definition, 151
 menus, 74
 Microcellular system component, 7
 object manager window, 73
 property sheet layout, 76

AFP Station

AFP software communication with, 10
connection through MCU, 10
Microcellular system component, 7
serial connection to MAT, 3, 10
TCM connection to MAT, 3, 6, 10

AFPS

See AFP Station.

Alarm and Power Supply module

Field Replaceable Unit, 104
replacing, 108
troubleshooting, 92

alarm generation, 11

alarm information (table), 88

alarm management application, 149

alarms

fan failure, 89
high temperature, 89
warm-up, 89

Algebraic Code Excited Linear Predictive

See ACELP.

AMO

Antenna Matrix/Oscillator, 104
definition, 152
Field Replaceable Component, 104
troubleshooting, 98

Answering a Call Waiting call, 121

antenna array

Microcellular system component, 7
structure, 152

antenna matrix

definition, 152
replacing, 107

APS

See Alarm and Power Supply module.

Attendant End-to-End Signaling, 127

Attendant Features, X11

Attendant Administration, 127

Attendant End-to-End Signaling, 127

Automatic Time Reminders, 127

Barge-In/Busy Verify, 127

Busy Lamp Field, 128

Splitting, 128

Automatic Frequency Planning

CMCP control, 11

definition, 153

Mobility System Management feature, 10

RSSI measurements, 80

See also AFP region.

See also AFP Station.

Automatic Frequency Planning Station

See AFP Station.

Automatic Time Reminders, 127

B

Barge-In/Busy Verify, 127

Base Station

See Microcellular Base Station.

basic call operations, 115

basic call setup, 111

Basic Call, NA ISDN PRA Connectivity, 139

battery power low, 103

BRSC, definition, 154

Busy Lamp Field, 128

C

CAI

See Common Air Interface.

Call Forward

Call Forward All Calls, 129

Call Forward Busy, 129

Call Forward External, 129

Call Forward No Answer, 130

verifying (procedure), 118

Call Forward All Calls, 117, 129

activating (procedure), 117

cancelling (procedure), 118

Call Forward Busy, 129

Call Forward External, 129

Call Forward No Answer, 130

Call Hold, 130

Call Park, 131

answering a recall (procedure), 121

retrieving parked call (procedure), 120

Call Park - Networkwide, 131

Call Redirection Service, 140

Call Transfer, 133

Call Transfer procedure, 124

Call Waiting, 121, 133

Call Waiting Redirection, 133

Called Party Disconnect Control, 134

Calling Line ID, 134

Calling Line Identification, 139

Calling Party Name Display, 134

CDR on Redirected Incoming Calls, 128

cell

definition, 155

menus, 58

Microcellular system component, 7

object manager window, 57

property sheet layout, 60, 61

cellco

See cellular company.

Cellco Mobility Control Point

See CMCP.

cellular

definition, 155

Microcellular portable, 3

cellular company, 155

cellular service provider

See cellular company.

Centrex Switchhook Flash, 135

CLID, 134

CMCP

- control of Microcellular system, 3
- control over Microcellular system, 11
- definition, 156
- frequency management, 11
- heartbeat monitoring, 11
- Microcellular configuration, 11
- Microcellular system component, 7
- CMCP heartbeat failure, troubleshooting, 101
- combiner
 - See hybrid.
- command, object manager, 27
- Common Air Interface, 156
- Conference (3- and 6-party), 135
- configuration
 - deleting objects, 81
 - LD 27 for MISP configuration, 34
 - MSPRE subsystem properties, 35
- Configuration page, zone, 55, 56
- configuration problems, troubleshooting, 101
- control, object manager, 27
- Core
 - See Meridian 1 Core software.
- CPND, 134
- CSMO, 158

D

- data storage, 10
- D-Channel failure, 103
- definitions, 151
- deleting objects, 81
- deregistration, 158
- dial-access features, 116, 117
- Direct Inward System Access, 135
- Direct Private Network Access, 135
- directory number
 - See DN.
- Directory Number Expansion, 135
- distributed antenna system, 158
- DLC, 159
- DN, 159
- downlink, 159
- Dual 8-Port Hybrid, 160

E

- EFRC
 - ACELP implementation, 3
 - definition, 160
- EIMC
 - definition, 161
 - menus, 41
 - Microcellular system component, 7
 - OA&M activities, 11
 - Object Manager window, 40
 - property sheet, 43
- Electronic Switched Network, 136
 - End-to-End Signaling, 136
 - Network Alternate Route Selection, 136
 - Network Call Transfer, 137
 - Network Class of Service, 137
 - Network Control Signaling, 137
 - Network Ring Again, 137
 - Uniform Dialing Plan, 136
- Embedded Intelligent Mobility Controller
 - See EIMC.
- Enbloc Dialing, 161
- End-to-End Signaling, 136
- Enhanced Flexible Hotline, 138
- ESN, 161
- Ethernet, MAT connection to Meridian 1, 10
- Exclusive Hold, 130

F

- fan assembly, replacing, 109
- fan failure alarms, 89
- FCC, 162
- feature code string, 162
- feature description
 - basic call setup, 111
 - handoffs, 111
 - registration/deregistration, 111
- feature interactions
 - portable and wireline terminals, 125
 - X11, 125
- Flexible Hotline, 138
- forward channel, 162
- frequency management, 11

G

generic object manager
 control definitions (table), 24
 menus, 25
 object manager window, 24
 property sheet, 32

H

handoff, 163
heartbeat
 CMCP monitoring, 11
 definition, 163
 subsystem property page, 36
Heartbeat property page, 36
Help system, 31
high temperature alarms, 89
Hotline, 138
Hunting, 138
hybrid
 definition, 163
 Microcellular system component, 7

I

IMS/IVMS Text/Voice Messaging, 141
incoming call, 111, 164
INIT ACD Queue Call Restore, 138
initialization, 10
intercept treatments, 139
interzone handoff, 164
Intrazone handoff, 164
IPE, 164
IS-136
 definition, 164
 radio protocol, 3
IS-54B
 definition, 164
 radio protocol, 3
IS-641
 ACELP implementation, 3
 definition, 165
ISDN
 definition, 165
 MISP, 7

ISDN CLID Enhancement, 139

ISDN PRI

 Basic Call, NA ISDN PRA Connectivity, 139
 Call Redirection Service, 140
 Calling Line Identification, 139
 features, 139
 Network CPND, 140

L

LD 27, MISP configuration, 34
LED information (table), 88
local MSM MAT, 3, 10
lock management facility, 150
log browser application, 150
low battery power, 103

M

macrocellular system, 3, 11
Malicious Call Trace, 140
master oscillator, 166
MAT
 access to Meridian 1, 150
 alarm management application, 149
 definition, 166
 deleting objects, 81
 Ethernet connection to Meridian 1, 10
 local MSM, 3, 10
 lock management facility, 150
 log browser application, 150
 Microcellular system component, 7, 10
 modem connection to Meridian 1, 10
 MSPRE property page, 37
 platform for MSM application, 9, 10
 session control, 150
 shell application, 149
 Subsystem Object Manager, 35
 Subsystem property sheet, 36
 System window, 21, 22
MAT user interface
 access to Meridian 1, 150
 log browser application, 150
 Navigator window, 20
 shell application, 149

MBS

- managing, 63
- menus, 64
- object manager menus, 64
- object manager window, 63
- property sheet layout, 66
- removing power from, 105
- See also Microcellular Base Station.
- troubleshooting, 87

MCFO default codes (table), 116**MCRA**

- See Multiple Call Arrangement Allowed.

MCRD

- See Multiple Call Arrangement Denied.

MCU

- See Meridian Communications Unit.

menus, object managers

- AFP region, 74
- cell, 58
- EIMC, 41
- generic menus, 25
- MBS, 64
- MXC, 47
- radio, 69
- zone, 52

Meridian 1 Core software

- definition, 167
- Microcellular system component, 7

Meridian 1 features in Microcellular system, 112**Meridian 1 INIT operation, troubleshooting, 102****Meridian 1 system**

- C-Series, 167
- Microcellular subsystem, 3, 10
- OA&M server, 10

Meridian 1 System window, 22**Meridian Administration Tool**

- See MAT.

Meridian Communications Unit, 3, 10

- AFPS Microcellular component, 7
- definition, 167

Meridian Mail, 142**Message Centers, 141, 144****Message Waiting Center, 142****Message Waiting Indication Interworking, 141****Message Waiting Indicator, 168****MFCO, 116**

- See Mobility Feature Code.

microcell, definition, 168**Microcellular Base Station**

- definition, 168
- Microcellular system component, 7
- See also MBS.

Microcellular card failure, troubleshooting, 101**Microcellular system**

- Automatic Frequency Planning, 11
- CMCP heartbeat, 11
- CMCP monitoring, 11
- components
 - hardware, 7
 - logical, 7
 - software, 7

frequency management, 11**in Meridian 1 system, 10****introduction, 3****Meridian 1 subsystem, 3****Option 11C model, 6****Option 51C-81C model, 4****serial connection to AFPS, 5****Microcellular system components**

- CMCP configuration of, 11
- diagram, 8
- MAT, 10
- Mobility System Management, 10
- OA&M, 9
- Option 11C, 6
- Options 51C, 61C, 81, and 81C, 3
- serial connection to AFPS, 3

Microcellular Transcoder Card

- See MXC.

MISP

- definition, 171
- Microcellular system component, 7

MOB, 169**mobile station, 169****Mobility Feature code, 169****Mobility Service Provider, 169**

- Mobility Special Prefix code, 169
- Mobility System Management
 - AFP feature, 10
 - definition, 169
 - MAT OA&M interface, 10
 - Microcellular system component, 10
 - OA&M functions, 9
- modem
 - CMCP connection to Meridian 1, 11
 - MAT connection to Meridian 1, 10
 - short-haul, 7
- MSPRE
 - description, 116
 - property page, 37
 - subsystem properties, configuration, 35
- Multi-Customer, 143
- Multiple Appearance Directory Number, 142, 171
- Multiple Call Arrangement Allowed, 171
- Multiple Call Arrangement Denied, 171
- Multi-Purpose ISDN Signaling Processor
 - See MISP.
- Music Package/Enhanced Music, 143
- MWI
 - See Message Waiting Indicator.
- MXC
 - definition, 168
 - menus, 47
 - Microcellular system component, 7
 - OA&M activities, 11
 - Object Manager window, 46
 - property sheet layout, 49
 - See also Microcellular Transcoder Card.

N

- Navigator window, MAT user interface, 20
- neighbor cell
 - Microcellular system component, 7
- Network Alternate Route Selection, 136
- Network Call Transfer, 137
- Network Class of Service, 137
- Network Control Signaling, 137
- Network CPND (ISDN PRI), 140

- Network Message Services
 - Message Centers, 144
 - TRO Before Answer, 144
- Network Ring Again, 137
- Night Service/TAFAS, 144
- noncompliance of portable, troubleshooting, 102
- normal call operations
 - actions, 115
 - procedures by call type, 115

O

- OA&M
 - alarm generation, 11
 - CMCP tasks, 11
 - components, 9
 - EIMC activities, 11
 - Meridian 1 server, 10
 - Mobility System Management functions, 9
 - MSM MAT application, 10
 - Operational Measurements, 11
 - overview, 9
 - recovery, 11
- object manager
 - commands, 27
 - controls, 27
 - deleting objects, 81
 - subsystem, 35
- object manager windows
 - AFP region, 73
 - cell, 57
 - EIMC, 40
 - generic, 24
 - MBS, 63
 - MXCs, 46
 - radio, 68
 - zone, 52
- One Number Call Delivery, 145
- Operational Measurements, 11, 83
- operations, administration, and maintenance
 - See OA&M.
- outgoing call, 111, 173

P

Pad Value, 173
parking a call (procedure), 119
partition
 See cell.
physical TN, 174
Point-to-Point Protocol
 see PPP.
portable
 definition, 174
 microcellular system component, 7
 troubleshooting, 100
portable not located, troubleshooting, 101
PPP
 CMCP communications with Meridian 1, 11
 modem connection to MAT, 10
Pretranslation, 145
primary surge protector, 174
Privacy, 147
procedures
 replacing a fan assembly, 109
 replacing a TRU-II radio, 106
 replacing an antenna matrix, 107
 replacing the APS unit, 108
property page
 MSPRE, 37
property sheets
 common controls (table), 33
 layout
 AFP region, 76
 cell, 60, 61
 EIMC, 43
 MBS, 66
 MXC, 49
 objects, 31
 radio, 71
 subsystem, 36
 zone, 56
protocol
 See radio protocol.

Q

Quad 4-Port Hybrid, 175

R

radio
 managing, 68
 menus, 69
 object manager window, 68
 property sheet layout, 71
 replacing, 106
 See TRU-II.
 troubleshooting, 90
Radio Line Card
 See Microcellular Transcoder Card.
radio link, 175
radio protocol
 IS-136, 3
 IS-54B, 3
 IS-641, 3
Recorded Announcement, 145
recovery, 10, 11
registration, 176
registration/deregistration, 111
related references, 2
replacing faulty devices, 104
reverse channel, 176
RF, 176
roaming, 176
RPI (Remote Power Interconnect) units, 176
RSSI, 176

S

secondary power surge protector
 See supplemental power surge protector.
Secretarial Filtering, 146
serial connection to AFPS, 3, 10
server
 Meridian 1 system, 10
session control, 150
set model, 177
short-haul modem, 3, 7
signal degradation, troubleshooting, 102
site planning, 177
Speed Call, 146
Splitting, 128

subsystem

- Heartbeat property page, 36
- Microcellular system component, 7
- MSPRE property page, 37
- object manager, 35
- property sheet, 36

Subsystem Object Manager window, 35

Subsystem property sheet, 36

supplemental power surge protector, 178

System Speed Call, 123, 146

system version, 178

System window, 21, 22

T

TCM, 179

TCM cable, 179

TCM connection to AFPS, 3, 6, 10

TDMA-3

- ACELP, 3

- definition, 179

terms, 151

Three-Party Conference, 122

Timed Forced Disconnect, 147

TN

- definition, 179

- physical, 174

- virtual, 180

tones on portables, 117

transcoder, 180

TRO Before Answer, 144

troubleshooting

- Alarm and Power Supply module, 92

- AMO, 98

- CMCP heartbeat failure, 101

- configuration problems, 101

- MBS, 87

- Meridian 1 INIT operation, 102

- Microcellular card failure, 101

- noncompliance of portable, 102

- portable, 100

- portable not located, 101

- radio, 90

- signal degradation, 102

TRU-II

- definition, 180

- Microcellular system component, 7

Trunk Anti-Tromboning, 147

U

Uniform Dialing Plan, 136

uplink, 180

user interface

- menus, 25

- property sheet layout, 31

User Selectable Call Redirection, 147

V

Vector Sum Excited Linear Predictive

- See VSELP.

version number

- See system version.

virtual TN, 180

VSELP

- definition, 181

- voice encoding, 3

W

warm-up alarms, 89

Wireless Privacy, 147

- definition, 171

X

X11 feature interactions, 125

Z

zone

- definition, 182

- menus, 52

- Microcellular system component, 7

- object manager window, 52

- property sheet, Configuration page, 55, 56

zone controller, 182

Meridian 1

Nortel COMPANION

Microcellular

Operations, administration, and
maintenance guide

© 1997 Northern Telecom

All rights reserved

Information is subject to change without notice.

Northern Telecom reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant. This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules, and the radio interference regulations of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

SL-1™, Meridian 1™, and COMPANION™ are trademarks of Northern Telecom. Microsoft® is a registered trademark and Windows™ and MS Windows™ are trademarks of Microsoft Corporation. ANDREW® and HELIAX® are registered trademarks of Andrew Corporation. NOKIA® is a registered trademark of Nokia Corporation. ZK-SAM™ is a trademark of ZK CELLTEST INC. ORBIX™ is a trademark of IONA.

Publication number: 553-3611-300

Document release: Standard 2.00

Date: December 1997

Printed in the United States of America